

Environmental Consequences

Introduction

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of a proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. This chapter analyzes the environmental impacts of the five *Merced River Plan/FEIS* alternatives on natural resources, cultural resources, the visitor experience, and social resources. This analysis provides the basis for comparing the beneficial and adverse effects of the alternatives.

Due to the conceptual nature of the alternatives, their potential consequences can be addressed only in qualitative terms. The conclusions presented herein are based on review of existing information provided by the National Park Service. If and when specific National Park Service developments or other actions are proposed as a result of the *Merced River Plan/FEIS*, National Park Service staff will determine whether more detailed environmental documentation is required, consistent with the provisions of NEPA.

Following this introduction, the chapter presents the methodologies used in the environmental impact analysis. The impact analyses sections are organized by alternative. The first section analyzes Alternative 1 (the No Action Alternative), including impacts on natural resources, cultural resources, the visitor experience, and social resources, and presents mitigation measures, cumulative impacts, and impact conclusions. The same framework of analyses is then applied to Alternatives 2, 3, 4, and 5 in subsequent sections. Environmental impacts are summarized in table II-9: Impact Summary Table, located at the end of Chapter II of this document.

Cumulative Impacts

A cumulative impact is described in regulations developed by the Council on Environmental Quality (CEQ), regulation 1508.7, as follows:

a “Cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

To determine potential cumulative impacts, projects within the region surrounding Yosemite National Park were identified. The region, or assessment area, included eight surrounding counties (Mariposa, Madera, Fresno, Merced, Stanislaus, Tuolumne, Inyo, and Mono), four national forests (Sierra, Stanislaus, Inyo, and Toiyabe), nearby lands administered by the Bureau of Land Management, and lands administered by the National Park Service within Yosemite National Park and the El Portal Administrative Site. Projects occurring within the jurisdictional areas of five city governments in the region (Oakdale, Fresno, Merced, Modesto, and San Francisco – Hetch Hetchy Water and Power) and two private organizations (Pacific Bell and Pacific Gas & Electric Company) also were identified. Projects were identified through correspondence and phone calls with county and city governments and federal land managers. Potential projects, identified as “cumulative actions,” included any planning or development activity that was currently being implemented or would be implemented in the reasonably foreseeable future.

Appendix G contains the list of reasonably foreseeable future actions included in the cumulative impacts analysis. These cumulative actions are evaluated in the impact analysis in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular natural, cultural, or social resource. Because most of these cumulative actions are in the early planning stages, the evaluation of cumulative impacts was based on a general description of the project. Past actions were not included in the cumulative actions list, because many of these actions are already described in the Affected Environment, Chapter III, and in other locations in the document.

Methodologies

This section presents the methodologies used to conduct the environmental impact analyses. The section begins by describing methodologies and assumptions common to all resource topic areas, and then presents methodologies specific to individual resource topic areas in the following order:

Natural Resources: Geology, Geohazards, and Soils; Hydrology, Water Quality, and Floodplains; Wetlands; Vegetation; Wildlife; Rare, Threatened, and Endangered Species; Air Quality; and Noise

Cultural Resources: Archeological Resources; Ethnographic Resources; and Historic Resources, including sites, structures, and cultural landscape resources

Visitor Experience: Recreation; Interpretation & Orientation; Visitor Services; and Wilderness Experience

Social Resources: Land Use; Transportation; Scenic Resources; Socioeconomics; and Park Operations and Facilities

Each resource topic area includes a discussion of the impact assessment, and the context, intensity, duration, and type of impact. The context of the impact considers whether the impact would be local or regional. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. The duration of the impact considers whether the impact would occur in the short term (temporary) or the long term (permanent). The type of impact considers whether the impact would be beneficial or adverse to the natural, cultural, or social environment.

Pursuant to NEPA requirements, the impact analyses for Alternative 1 (the No Action Alternative) compare resource conditions under Alternative 1 in the year 2020 to existing conditions in the year 1999. The impact analyses for the action alternatives (which collectively refers to Alternative 2, Alternative 3, Alternative 4, and Alternative 5) compare the action alternative in the year 2020 to the No Action Alternative in the year 2020.

It is assumed that annual park visitation would increase over 1999 levels by the year 2020. Although it is not known how much annual visitation would increase by 2020, the Restricted Access Plan would continue to be implemented to manage Yosemite Valley visitation. Increased visitation demand (over 1999 levels) would trigger the need to implement the Restricted Access Plan on an increasing number of days during the peak season, and it is expected that there would be more “restricted access” days in 2020 than currently experienced. It is expected that increases in 2020 visitation levels would occur primarily during the current nonpeak periods (e.g., during months on either side of peak summer months, and on weekdays during peak summer months).

In 2020, annual visitation demand is assumed to be the same among all of the alternatives. Accommodation of annual visitation demand would be the same among all of the alternatives, except Alternative 4. Under Alternative 4, application of the management zoning prescriptions in the quarter-mile Merced River corridor boundary would limit the availability of space in Yosemite Valley for concentrated areas of day-visitor parking, park accommodations, and high-intensity visitor recreation areas. As a result, it is assumed that annual visitation demand would not

be accommodated in the Valley under Alternative 4, and some visitors could be displaced to other areas of the park or displaced from the park itself.

The Merced River Plan is a prescriptive plan. It prescribes management zones within the Merced River corridor that provide guidance for park management on how to manage the resources within the corridor. However, the plan does not recommend implementation of specific developments or actions. The Merced River Plan is a management plan, and not an action or implementation plan. To provide decision makers and the public with an accurate idea of the environmental consequences of the *Merced River Plan/FEIS* alternatives, the analysis team identified potential actions that could result from the application of the management zoning prescriptions under each of the action alternatives, and analyzed their effects as compared to conditions under the No Action Alternative. The environmental consequences analyses are qualitative rather than quantitative, because the action alternatives are conceptual and specific actions are not prescribed under this plan.

Natural Resources

Geology, Geohazards, and Soils

This impact assessment focused on effects that geologic processes in the Yosemite National Park would have on visitors, personnel, and facilities under each alternative of the *Merced River Plan/FEIS*. Geologic processes can negatively affect visitors, personnel, and facilities when events such as rockfalls, earthquakes, and severe soil instability result in injury, death, or damage to facilities.¹ The assessment also focused on what effect the *Merced River Plan/FEIS* alternatives would have on the geologic processes, namely the formation and conservation of soil resources. Development actions prescribed in the *Merced River Plan/FEIS* could affect the current soil resources through accelerated erosion, soil loss, or soil removal.

Several assumptions regarding facility placement, geologic design parameters, and public safety were integrated into this assessment, as summarized below.

- It is not possible to avoid risks due to geologic processes such as earthquakes and rockfalls. Considering this, some facilities located within park, especially the Yosemite Valley the Merced River gorge, and El Portal would be exposed to risks of damage from rockfalls.
- Geotechnical studies to determine soil stability conditions would be performed prior to placing, designing, or relocating a facility within the park, and facility design within Yosemite National Park would conform to accepted building codes regarding seismic design parameters.
- In emergency situations, the National Park Service may mechanically trigger a rockfall, but in most cases the National Park Service will allow natural processes to occur unimpeded.
- The National Park Service is currently revising its management policies pertaining to geologic resources and hazards. The focus of these guidelines will be to protect visitors, employees, and infrastructure from geologic hazards and to locate facilities out of geologically hazardous areas.

¹ Throughout Chapter IV, unless otherwise noted, “rockfalls” is used as a generic term to refer to rockfalls in the stricter sense but also to rockslides, debris avalanches, debris flow, and rock avalanches.

- In the event of a rockfall, the National Park Service would close the affected area to protect visitor and employee safety. Rocks on roads would be removed, but rockfall talus in rivers would not be removed, unless the river is dammed and flooding threatens utilities or facilities.

Geologic risks that affect public safety are rarely predictable, and the extent to which they can affect people and property cannot be quantified. Quantitative analysis of other potential effects, such as soil erosion, removal, and loss was not feasible for this impact assessment due to the prescriptive nature of the Merced River Plan. Rather, analysis of effects was qualitative, and professional judgment has been applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts. When possible, mitigation measure(s) were incorporated into the *Merced River Plan/FEIS* to reduce the intensity of adverse effects.

Impact Assessment

The impact assessment addressed geologic hazards (earthquakes and rockfalls) and impacts to soil resources. Geologic hazards that would expose people to injury and infrastructure to damage were considered in terms of impacts to public safety. Geologic impacts related to facility development or natural resource protection were considered in terms of depletion of or adverse effects on soil resources. Proposed management prescriptions under the *Merced River Plan/FEIS* were evaluated in terms of the context, intensity, and duration of the geologic impacts, and whether the impacts were considered to be beneficial or adverse to visitors, infrastructure, or soil resources.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or the El Portal Administrative Site. In considering geologic hazards, it was assumed that the impacts would be consistently local.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on public safety or soil resources. Minor impacts were those that would be present but not expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable, and could have an appreciable effect on public safety and soil resources. Major impacts would have a substantial, highly noticeable influence on public safety and soil resources.

There will always be a potential for adverse impacts to life and property due to geologic hazards in Yosemite National Park. Therefore, management actions to avoid placement of facilities in areas susceptible to geologic hazards may decrease the risks but would not necessarily reduce the intensity of the impact.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of impacts. A long-term impact would have a permanent effect on public safety and geologic conditions.

Type of Impact. Impacts were evaluated in terms of whether they would be beneficial or adverse to public safety and soil resources. Beneficial impacts would improve soil resources by restoring areas and limiting development. Adverse impacts would expose people and property to effects of earthquakes and rockfall events. Adverse impacts also would deplete or negatively alter soil resources.

Hydrology, Floodplains, and Water Quality

This section analyzed potential changes to hydrologic processes of the Merced River, including the river's interaction with its floodplain as well as water quality. This qualitative assessment focused on the physical and chemical processes of the Merced River that might be altered under the management practices called for as part of the proposed alternatives of the Merced River Plan. Quantitative analyses of any potential changes to the Merced River were not feasible due to the prescriptive nature of the Merced River Plan. Analysis of the alternatives was qualitative and based on identified hydrologic processes, as described in the Hydrology, Floodplains, and Water Quality section in Chapter III, Affected Environment.

Streamflow

The analysis examined potential changes to the free-flowing nature of the river as a result of management zone prescriptions listed under each of the action alternatives. This section addressed existing and potential future restrictions on streamflow and the possibility of removing current streamflow restrictions, such as dams or bridges.

Floodplain

This section qualitatively analyzed the impacts or benefits to the river's floodplain due to potential changes in intensity and location of visitor use along the river. Due to the qualitative nature of this assessment, a reduction or modification of visitor use and facility development in the floodplain was perceived to be beneficial to the floodplain and protection of the river channel.

Water Quality

The analysis identified potential effects on water quality associated with visitor use and the generation of nonpoint-source pollution, such as refuse and automobile-related pollutants. Additionally, the analysis examined potential impacts on water quality from construction or removal of facilities within the river's floodplain.

Impact Assessment

Proposed management prescriptions under the *Merced River Plan/FEIS* were evaluated in terms of the context, intensity, and duration of the hydrologic impacts, and whether the impacts were considered to be beneficial or adverse to the hydrologic environment.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur at localized areas due to the allowance of certain park operations, such as removal of bridges or construction of facilities. Regional impacts would be impacts on the river corridor within Yosemite National Park.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on the hydrology or quality of the river. Minor impacts were effects on hydrologic processes that were slightly detectable but not expected to have an overall effect on the character of the river or its floodplain. Moderate impacts would be clearly detectable and could have an appreciable effect on hydrologic processes, the adjacent floodplain, or water quality. Major impacts would have a substantial, highly noticeable influence on the hydrologic environment and could permanently alter river processes, floodplain formation and evolution, and water quality.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional activities, such as facility construction or road removal. A long-term impact would have a permanent effect on the hydrologic environment, such as altering the dynamic processes that govern the free-flowing nature of the river, floodplain formation and evolution, or the condition of water quality.

Type of Impact. Impacts were evaluated in terms of whether they would be beneficial or adverse to the hydrologic environment. Beneficial impacts would sustain streamflow dynamics, allow natural processes to prevail, and protect or improve water quality. Adverse impacts would negatively alter hydrologic processes, thereby hindering natural processes and reducing protection of the river, its floodplain, and water quality.

Wetlands; Vegetation; Wildlife; Rare, Threatened, and Endangered Species

NEPA calls for an examination of the impacts on all components of affected ecosystems. National Park Service policy is to protect the natural abundance and diversity of all of the park's naturally occurring communities. To provide a consistent basis for analyzing impacts, and to ensure alternatives are compared using the same frame of reference, the methodology described below was developed.

Some aspects of impact assessment methodology relate simply to whether an action breaches federal laws, regulations, and executive orders; similar state laws (for example, the California Endangered Species Act); or National Park Service *Management Policies* (including the river's Outstandingly Remarkable Values). A second level of impact assessment must address issues and concerns expressed during public scoping. The third, and probably most important, level compares a projected impact with the natural history of a species or the known sensitivities of a habitat.

Quantitative analysis—that is, determining a measure of impact such as decibels of sound reaching the nest of a spotted owl—was not feasible for this methodology, because the *Merced River Plan* is prescriptive rather than action-specific. Qualitative analysis relies substantially on professional judgment, supported by extrapolation of relevant research, where appropriate, to reach reasonable conclusions as to the context, intensity, duration, and type of potential effect.

When possible, mitigation measure(s) were incorporated into the Merced River Plan to reduce the adverse effects of impacts to natural resources.

Impact Assessment

The starting point for impact assessment is the natural processes of the Merced River corridor, including size, physical foundation, and components of the natural communities and ecosystems. Analysis was based on the assumptions listed below.

- The greater the size of a biotic community and the stronger its links to neighboring communities, the more valuable it is to the integrity and maintenance of biotic processes. Development limits the size of a community and fragments and disassociates communities from each other.
- The more developed areas become, the less valuable they are as wildlife habitat. New development would increase human presence and increase the potential for soil, wildlife, and vegetation disturbance. The potential for negative wildlife interactions (such as human injury from wildlife and the introduction of unnatural food sources) also would increase. The removal of development from an area would increase the value of the habitat. However, in some cases, dispersal of the same number of visitors may well have a greater impact than an existing “containment” of disturbance within a designated area.
- The effects of human food on the behavior, distribution, and abundance of wildlife species would continue in existing developments and would begin in new developments unless adequate facilities, education, and enforcement were provided.
- The juxtaposition of natural communities to roads and other developments hinders the use of prescribed fire for restoring historic fire intensity, frequency, and severity.
- Development and activities near sensitive habitats may adversely affect adjacent natural communities. Modifications of a river channel may cause channel instability and shifting, increased bank erosion, and changes in flood-flow elevations. The presence of well-vegetated banks and a sufficient width of riverbank protects the integrity of the river channel and shore.
- Disturbance in or near a river and its tributaries may reduce the productive capabilities of associated natural communities. Modifications to river form, soil compaction, loss of riparian vegetation, removal of woody debris, and accelerated erosion and sediment transport influence important habitat characteristics such as riffle/pool complexes, substrate type, location, and cover. These physical aspects often determine the composition of vegetative and aquatic communities.
- Roads change water inflow and outflow patterns and may dewater sections of meadow. The lack of a sufficiently high water table in meadows allows exotic species to outcompete native vegetation and encourages conifer establishment, which threatens meadow communities.
- Roads generally form barriers for wildlife and fragment habitat.
- Development and impacts in riparian zones may influence critical water quality elements such as water temperature, suspended sediments, and nutrients. These elements interact in complex ways in aquatic systems and directly and indirectly influence patterns of growth, reproduction, and migration of aquatic organisms.
- Ecological restoration of native communities would involve some short-term negative impacts (e.g., smoke from prescribed burning) but over time can successfully replicate natural processes.

Proposed management prescriptions under the *Merced River Plan/FEIS* were evaluated in terms of the context, intensity, and duration of the impacts, as defined below, and whether the impacts were considered to be beneficial or adverse to the natural environment. Generally, the methodology for natural resource impact assessment follows direction provided in the *Council of Environmental Quality Regulations for Implementing the National Environmental Policy Act*, section 1508.27.

Context. Context suggests that certain impacts depend upon the setting of the proposed action. For instance, impacts that reduce the value of the Merced River in providing connectivity between habitat types could be minor if such connections are abundant in a given region, moderate or major if they are not. The context of the impact considers whether the impact would be local or regional.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. These designations are used to describe both beneficial and adverse impacts. Negligible impacts were effects considered detectable, but would have no principal effect on biological resources. Minor impacts were effects that were detectable but not expected to have an overall effect on natural community structure. Moderate impacts would be clearly detectable and could have an appreciable effect on individual species, community ecology (e.g., the numbers of different kinds of amphibians present), or natural processes (e.g., fire). Major impacts would have a substantial, highly noticeable influence on natural resources. This would include impacts that have a substantial effect on individual species, community ecology, or natural processes.

Duration. Under this heading, both short- and long-term effects are relevant. A short-term impact would be temporary in duration and would be associated with transitional types of impacts, such as facility construction or bridge removal. Long-term impacts are somewhat more conjectural. For example, research on National Park Service lands has documented long-term declines in bird species diversity at heavily used sites. Such a decline may take decades to become evident.

Type of Impact. The type of impact considers whether the impact would be beneficial or adverse to biological resources. Effects to biological resources are considered beneficial if an action causes no detrimental effect and results in an increase in rare species or habitat components, native ecosystem processes, native species richness/ diversity, or native habitat quantity and quality.

Air Quality

The air quality impact assessment involved the identification and qualitative description of the types of actions under the *Merced River Plan/FEIS* that could affect air quality, corresponding emissions sources and pollutants, and relative source strengths. Based on the relative source strengths, a qualitative assessment was performed to determine the potential for higher pollutant emissions or concentrations, taking into account the frequency, magnitude, duration, location, and reversibility of the potential impact. In addition, regional pollutant transport issues were evaluated in the context of regional cumulative impacts.

Several assumptions were integrated into this assessment, as summarized below:

- The *Merced River Plan* would not affect the smoke management policies in the *Fire Management Plan*.
- The *Merced River Plan* would not affect the campfire regulations in the Valley.
- The *Merced River Plan* would not affect the policies of the Restricted Access Plan.
- The National Park Service would continue to ensure that all stationary emissions sources under its control or under the control of its concessioners comply with applicable air district rules and regulations.
- The National Park Service would continue to participate in the regional air quality planning processes for ozone, PM-10/PM-2.5, and visibility impairment and would continue to review applications for new or modified major stationary sources upwind of the park, pursuant to Prevention of Significant Deterioration regulations.
- The National Park Service would comply with U.S. Environmental Protection Agency's general conformity rule for any future actions under the Merced River Plan that would occur within Madera County, which is part of San Joaquin Valley Air Basin, a nonattainment area for national ozone and PM-10 standards, and within Mariposa County, which is likely to be designated in the near future as a nonattainment area for the new national eight-hour ozone standard.

Quantitative analysis of potential air quality impacts was not feasible due to the prescriptive nature of the Merced River Plan. Rather, analysis of effects was qualitative, and professional judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts. When possible, mitigation measure(s) were incorporated into the *Merced River Plan/FEIS* to reduce the intensity of adverse effects.

Impact Assessment

Relative to the No Action Alternative, the *Merced River Plan/FEIS* would change corridor boundaries and Outstandingly Remarkable Values along segments of the main stem and South Fork of the Merced River and would impose management zoning prescriptions. The air quality impact assessment of the plan evaluated how these three basic types of changes would affect air pollutant emissions and concentrations. Air quality impacts were evaluated in terms of their context, intensity, and duration, and whether the impacts were considered to be beneficial or adverse.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or the El Portal Administrative Site. Regional impacts would be those related to the applicable air basins, Mountain Counties Air Basin and San Joaquin Valley Air Basin. With respect to air quality issues, both local and regional perspectives were relevant.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on air quality. Minor impacts were those that would be present but not expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable and

could have an appreciable effect. Major impacts would have a substantial, highly noticeable influence on local or regional air quality.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of impacts. A long-term impact would have a permanent effect on air quality.

Type of Impact. Impacts were evaluated in terms of whether they would be beneficial or adverse to air quality. Beneficial air quality impacts would reduce emissions or lower concentrations, and adverse impacts would have the opposite effect.

Noise

The noise impact assessment involved the identification and qualitative description of the types of actions under the *Merced River Plan/FEIS* that could affect the ambient noise environment, corresponding noise sources, relative source strengths, and other characteristics. Based on the relative source strengths, a qualitative assessment was performed to determine the potential for a substantial increase in ambient noise levels in areas where natural quiet is an Outstandingly Remarkable Value. Assessments were also performed where noise-sensitive uses are located or would expose persons to excessive noise levels taking into account the frequency, magnitude, duration, location, and reversibility of the potential impact. In addition, regional noise issues, such as aircraft overflights, were discussed in the context of long-term trends in wilderness noise exposure.

Several assumptions were integrated into this assessment, as summarized below:

- The *Merced River Plan* would not affect the wilderness permit system arising from the *Wilderness Management Plan*.
- The *Merced River Plan* would not affect the policies of the Restricted Access Plan.

Quantitative analysis of potential noise impacts was not feasible due to the prescriptive nature of the *Merced River Plan*. Rather, analysis of effects was qualitative, with professional judgment applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts. When possible, mitigation measure(s) were incorporated into the *Merced River Plan* to reduce the intensity of adverse effects.

Impact Assessment

Relative to the No Action Alternative, the *Merced River Plan/FEIS* would change corridor boundaries and Outstandingly Remarkable Values along segments of the main stem and South Fork of the Merced River and would impose management zoning prescriptions. The noise impact assessment evaluated how these three basic types of changes of the plan would affect the ambient noise environment in the corridor. Noise impacts were evaluated in terms of the their context, intensity, and duration, and whether the impacts were considered to be beneficial or adverse.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or El Portal. In considering noise impacts, it was assumed that the impacts would be consistently local.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on the ambient noise environment. Minor impacts were those that would be slightly detectable but not expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable and could have an appreciable effect. Major impacts would have a substantial, highly noticeable influence on the ambient noise environment.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of impacts. A long-term impact would have a permanent effect on the ambient noise environment.

Type of Impact. Impacts were evaluated in terms of whether they would be beneficial or adverse to the ambient noise environment. Beneficial noise impacts would reduce associated levels and/or exposure, while adverse impacts would have the opposite effect.

Cultural Resources

Section 106 of the National Historic Preservation Act requires a federal agency to take into account the effects of its undertaking on properties included in, or eligible for inclusion in, the National Register of Historic Places and provide the Advisory Council on Historic Preservation the reasonable opportunity to comment. This also applies to properties not formally determined eligible, but which are considered to meet eligibility requirements.

The methodology for assessing impacts to historic resources is based on the May 14, 1999 Programmatic Agreement (see Appendix H). This includes: (1) identifying areas that could be impacted; (2) assessing the level of resource information available, and conducting appropriate inventories and evaluations necessary to obtain information about resources potentially eligible for listing in the National Register; (3) comparing the area of potential effect with that of resources listed, eligible, or potentially eligible for listing in the National Register of Historic Places; (4) identifying the extent and type of effect; (5) assessing these effects according to procedures established by the Advisory Council's regulations; and (6) considering ways to avoid, reduce or mitigate adverse effects.

Cultural resource impact analysis in this environmental impact statement is described in terminology consistent with the regulations of the Council on Environmental Quality (CEQ). CEQ regulations require that the impacts of alternatives and their component actions be disclosed. It is intended, however, to comply with the requirements of both the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA). The determination of effect for the undertaking (implementation of the alternative) required by the 1999 Programmatic Agreement is included in the "Conclusions" section for each alternative.

Consistent with CEQ regulations, the analysis of individual actions includes identification and characterization of potential impacts, including an evaluation of impact intensity. This is a fundamental difference between NEPA and NHPA; wherein NHPA requires determinations of no effect or effect, and further requires where there is a determination of effect, a determination of whether that effect is adverse or not adverse. Intensity of impacts in the cultural resource analysis then, for purposes of NEPA, is defined as:

Negligible – Impact is barely perceptible and not measurable; confined to small areas or a single contributing element of a larger national register district or archeological site(s) with low data potential

Minor – Impact is perceptible and measurable; remains localized and confined to a single contributing element of a larger national register district or archeological site(s) with low to moderate data potential

Moderate – Impact is sufficient to cause a change in character-defining feature; generally involves a single or small group of contributing elements or archeological sites(s) with moderate to high data potential

Major – Impact results in substantial and highly noticeable change in character-defining features; involves a large group of contributing elements and/or individually significant property or archeological site(s) with high to exceptional data potential

Archeological resources are typically considered eligible for inclusion in the National Register of Historic Places because of the information they have or may be likely to yield. Intensity of impacts to archeological resources relates, additionally, to the importance of the information they contain and the extent of disturbance/ degradation.

Ethnographic resources are considered eligible for inclusion in the National Register as Traditional Cultural Properties when they are rooted in a community's history and are important in maintaining the continuing cultural identity of the community and meet criteria for evaluation and integrity. Intensity of impacts to ethnographic resources may relate to access and use of, as well as changes to, traditionally important places.

CEQ regulations, moreover, call for a discussion of the “appropriateness” of mitigation and NPS-12, the *National Environmental Policy Act Guideline* of the National Park Service, requires an analysis of the “effect” of mitigation. The “resultant” reduction in intensity from mitigation is an estimate of the effectiveness of mitigation under NEPA. It does not suggest that the level of effect as comprehended by Section 106 is similarly reduced. Although adverse effects under Section 106 may be mitigated, for example, the effect remains adverse.

Mitigation for NEPA purposes in this environmental impact statement is based on the park's 1999 Programmatic Agreement and includes avoidance of adverse effects or application of one or more Standard Mitigation Measures described in Stipulation VIII(A) of this agreement. Avoidance strategies may include application of the Secretary of Interior's Standards, design methods such as vegetation screening when placing new facilities in a historic district, and development of design standards to ensure compatibility. In the case of archeological resources, mitigation includes avoidance of sites through design or avoidance of adverse effects through recovery of information that makes sites eligible for inclusion in the National Register. Generally, this data recovery will be based on the 1999 *Archeological Synthesis and Research Design*. In Stipulation

VIII of the 1999 Programmatic Agreement, Standard Mitigation Measures may be implemented when avoidance is not feasible or prudent and the undertaking may result in an adverse effect on historic properties. Standard Mitigation Measures include documentation according to standards of the Historic American Buildings Survey/Historic American Engineering Record as defined in the October 1, 1997 Re-Engineering Proposal. The level of this documentation, which includes photography and a narrative history, would depend on significance (national, state, local) and individual attributes (individual elements of a cultural landscape, individually significant structures, etc.). When demolition of a historic structure is proposed, architectural elements and objects may be salvaged for reuse in rehabilitating similar structures or added to the park's museum collection. In addition, the story of history of alteration of the human environment, and reasons for that alteration, will be interpreted to park visitors.

According to Stipulation VII(C) of the 1999 Programmatic Agreement, impacts to archeological resources are considered “not adverse” for purposes of Section 106, if data recovery is carried out in accordance with the 1999 research design. Under the revised regulations of the Advisory Council on Historic Preservation of May 18, 1999 (36 CFR 800, Protection of Historic Properties, Final Rule and Notice), data recovery is considered to be an “adverse effect.” However, according to Part 800.3(A)(2) of those revised regulations, provisions of programmatic agreements in existence at the effective date of the new regulations remain in effect.

The National Park Service would continue to consult with culturally associated Indian tribes according to stipulations of the Programmatic Agreement and specific agreements, such as the October 17, 1999 Agreement Between the National Park Service, Yosemite National Park, and the American Indian Council of Mariposa County, Inc. for Conducting Traditional Activities, to develop appropriate mitigating strategies for effects to ethnographic resources. Such strategies could include identification of and assistance in providing access to alternative resource gathering areas, continuing to provide access to traditional use or spiritual areas and screening new development from traditional use areas.

Visitor Experience

Introduction

This impacts analysis evaluated four separate aspects of visitor experience, including recreation, interpretation and orientation, visitor services, and wilderness experience. Separate methodologies have been developed for each of these impact areas. This analysis evaluated the quality characteristics of the visitor experience in terms of how they might be altered as a result of the management zone prescriptions in the alternatives.

Visitor experience in Yosemite National Park encompasses a broad spectrum of elements, including access to and availability of recreational opportunities, interpretation and orientation programs, various visitor services, and to the Yosemite Wilderness. In addition, every individual visitor to Yosemite brings unique expectations and thus each has a unique experience. As a result, the environmental impact statement identifies, where possible, how the quality of the experience

would change given application of the management zoning prescriptions in each of the action alternatives.

Developing a quantitative analysis of potential effects on visitor experience is not feasible due to the prescriptive nature of the *Merced River Plan*. Analysis of effects is therefore qualitative, and professional judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts.

Assumptions that framed the analysis included the following:

- Visitor demand will increase over 1999 levels and will be the same among all of the alternatives.
- There would be no fundamental change to visitor access by private vehicle to the park.
- All lodging and camping facilities damaged and removed due to the 1997 flood would not be replaced in situ.
- There would be no change in access to the Yosemite Wilderness areas and no change to the wilderness permit system.
- Stock use would continue as currently managed.
- A diverse range of recreational activities is desirable.

Recreation

Analysis was based on whether there was a complete loss of a recreational opportunity, a change in access to or availability of a recreational opportunity, or a change in the aggregate of recreational opportunities for the visitor. This analysis evaluated how the management zone prescriptions would interact with all independent and group opportunities available in all segments of the Merced River, including the Valley, the Yosemite Wilderness, and in Wawona, such as floating, swimming and wading, hiking, backpacking, camping, rock climbing, fishing, sightseeing, photography, nature study, bicycling, and stock use.

Interpretation & Orientation

Impact analysis was based on whether there would be a change in the availability of the existing range of interpretation programs and orientation/information sources and services throughout the park resulting from the management zoning prescriptions under the alternatives.

Visitor Services

The analysis identified visitor services provided by the National Park Service, and the park partners, including the primary park concessioner that would be inconsistent with the management zone prescriptions under the alternatives. The services analyzed include all campgrounds (i.e., Merced Lake Backpackers Campground, Moraine Dome Backpackers Campground, Little Yosemite Valley Backpackers Campground, Camp 4, North Pines Campground, and Upper and Lower Pines Campgrounds), lodging (i.e., Yosemite Lodge, the Merced Lake High Sierra Camp, Housekeeping Camp, The Ahwahnee, Curry Village, and the Wawona Hotel), and food service and retail outlets in the Valley and in Wawona.

Wilderness Experience

Impact analysis associated with wilderness experience was based on whether there would be a change in opportunities for solitude and primitive recreation for the visitor in the wilderness, and/or a change in the ability of the visitor to access the Yosemite Wilderness.

Impact Assessment

The assessment focused on the context, intensity, and duration of impacts that would result from the proposed management prescriptions under the *Merced River Plan/FEIS*, relative to the four different aspects of visitor experience, and whether those impacts were considered to be beneficial or adverse to visitor experience. The assessment looked specifically at whether access to or availability of some aspect of visitor experience would be altered. The change in the characteristics or the quality of the experience was not considered in determining the intensity of an impact. This discussion was provided for contextual purposes only, to facilitate reader understanding of the implications of an impact.

Context

The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or the El Portal Administrative Site. Regional impacts would be impacts on the affected region, which is defined in Chapter III, Affected Environment.

Intensity

The intensity of the impact considers whether the impact to visitor experience would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable to the visitor and therefore expected to have no discernible effect. Minor impacts were effects that would be slightly detectable, though not expected to have an overall effect on the visitor experience. Moderate impacts would be clearly detectable to the visitor and could have an appreciable effect on the visitor experience. Major impacts would have a substantial, highly noticeable influence on the visitor experience and could permanently alter access to and availability of various aspects of the visitor experience.

Duration

The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration (or transition types of activities). It is not likely that there would be temporary visitor experience impacts associated with this plan. A long-term impact would have a permanent effect on the visitor experience, such as the permanent closure of a campground.

Type of Impact

Impacts were evaluated in terms of whether they would be beneficial or adverse to visitor experience. Beneficial impacts would allow greater access to or availability of a recreational

opportunity, interpretation or orientation program, other visitor services, or to a wilderness experience. Adverse impacts would reduce access to or availability of these four aspects of visitor experience.

Social Resources

Land Use

The land use analysis assumes that National Park Service policy concerning the acquisition of private lands within or adjacent to the park would not change. Thus, there would be no difference in land use policies between the No Action Alternative and the action alternatives.

For the purposes of an environmental analysis under NEPA and National Park Service guidelines on NEPA policies, land use within Yosemite National Park has the sole designation of public parklands. From the NEPA perspective, the public parklands land use designation includes the myriad of uses that may occur in a public park, including camping, hiking, parking, etc. Though the National Park Service applies management zoning in the Merced River corridor in the action alternatives, the management zones only designate management direction for particular areas within the park and do not change the basic land use of the park. The *Merced River Plan* addresses only the management of lands within Yosemite National Park and the El Portal Administrative Site, and the basic designation of land use for the park, as defined by NEPA, will not change as a result of implementing any alternative of the *Merced River Plan*.

Impact Assessment

Proposed management prescriptions under the *Merced River Plan/FEIS* were evaluated in terms of the context, intensity, and duration of land use impacts, and whether the impacts were considered to be beneficial or adverse to existing land use patterns.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur at specific locations within the park. Regional impacts would be related to regional land use patterns. For the purposes of this document, it was assumed that land use impacts would be consistently local.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on land use patterns or land use compatibility. Minor impacts were effects on land use patterns that would be slightly detectable but not expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable and could have an appreciable effect on land use patterns or result in land use incompatibility. Major impacts would have a substantial, highly noticeable land use incompatibility or would result in substantial changes to land use patterns.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated

with transitional types of activities. A long-term impact would have a permanent effect on land use patterns or land use compatibility.

Type of Impact. Impacts were evaluated in terms of whether they would be beneficial or adverse to land use patterns. Beneficial impacts would improve compatibility among land uses. Adverse impacts would negatively alter land use patterns or result in new land uses that would not be compatible.

Transportation

The focus of this impact assessment was on the effect of changes in overnight accommodation facilities (campgrounds and lodging), parking spaces, and alternative transportation systems (shuttle and regional transit buses) on traffic volumes and associated traffic flow and safety conditions. It was assumed that current alternative transportation services (regional public transit, shuttle buses, Valley floor tours, etc.) would remain essentially unchanged as a result of the *Merced River Plan*. Given the prescriptive nature of the *Merced River Plan*, it was assumed that the plan would not result in any substantial, quantifiable construction activity. It was also assumed that the Restricted Access Plan would continue to be used during peak season periods when criteria for implementation were met.

Quantitative analysis of potential effects was not feasible for this impact assessment due to the prescriptive nature of the *Merced River Plan*. Rather, analysis of effects was qualitative, and professional transportation engineering judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts. When possible, mitigation measure(s) were incorporated into the *Merced River Plan/FEIS* to reduce the intensity of adverse effects.

Traffic Flow Conditions

This section assessed potential changes in traffic volumes associated with changes to in-park visitor accommodations and/or parking facilities that could result from the application of the management zones under each of the action alternatives. Changes in traffic volumes were then judged as to whether they would substantially change the levels of congestion on the roadway system serving Yosemite National Park.

Traffic Safety/Conflicts

This section assessed potential changes in parking facilities (location and number of parking spaces) that could result from the application of the management zones. Possible changes in parking availability (e.g., parking supply could be reduced, with resulting unmet parking demand being accommodated by visitors parking their vehicles at roadside locations) were then judged, in the context of prevailing traffic volumes, as to whether increased roadside parking would substantially affect the potential for traffic conflicts.

Impact Assessment

Proposed management zones under the *Merced River Plan/FEIS* were evaluated in terms of the context, intensity, and duration of the transportation impacts, and whether the impacts were considered to be beneficial or adverse to traffic flow and/or traffic safety conditions.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or the El Portal Administrative Site. Regional impacts would be impacts on regional highways providing access to the park.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on traffic flow and/or traffic safety conditions. Minor impacts were effects on traffic flow and/or traffic safety conditions that would be slightly detectable but not expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable and could have an appreciable effect on traffic flow and/or traffic safety conditions. Major impacts would have a substantial, highly noticeable influence on traffic flow and/or traffic safety conditions and could permanently alter those conditions.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of activities. A long-term impact would have a permanent effect on traffic flow and/or traffic safety conditions.

Type of Impact. Impacts were evaluated in terms of whether they would be beneficial or adverse to traffic flow and/or traffic safety conditions. Beneficial impacts would improve traffic flow and traffic safety by reducing levels of congestion and occurrences of vehicle/vehicle, vehicle/bicycle, and vehicle/pedestrian conflicts. Adverse impacts would negatively alter traffic flow and traffic safety by increasing levels of congestion and occurrences of such conflicts.

Scenic Resources

The scenic resources analysis assumes that any policy change or action resulting from the *Merced River Plan* would conform with the National Park Service 1916 Organic Act.

For the purposes of this analysis, the *Merced River Plan* is assumed to have an impact (negative or beneficial) on scenic resources if it:

- Introduces into or removes from the visual landscape any human-made structure or infrastructure, as it is viewed from within the Merced River corridor
- Substantially changes the quality of the visual landscape, whether foreground, middle ground, or background
- Affects perceived viewer sensitivity, which is a function of the extent to which viewer activity is dependent on visual quality. This would include the viewer's experience in seeing any single viewpoint and in moving through a sequence of viewpoints, such as would be experienced in hiking along the river.

The scenic resources analysis is confined to an examination of the physical effects on viewsheds and on physical attributes of landscape features that define important views. The ability of a visitor to enjoy a particular visual landscape or sequence of landscapes also is affected by the quality of the air between the viewer and the landscape. The effect of air quality on visual resources, specifically visibility, is examined in the air quality section.

Impact Assessment

The overriding management purpose of any national park, as defined by the National Park Service 1916 Organic Act, is to conserve the scenery and natural and historic objects. Following this direction, the National Park Service determines impacts on scenic resources by examining the potential effects of the *Merced River Plan* on both the physical component (any change to the landscape character and/or features) and with respect to how that change is experienced (any change in visibility, viewpoints, etc.).

Impacts of the *Merced River Plan* and associated actions on visual resources are examined and determined by:

- Comparing the existing visual character of the landscape, characterized in terms of the color, textural scale, and formal attributes of landscape components and features, and the degree to which actions that may result from the *Merced River Plan* would affect (i.e., contrast or conform with) that character
- Analyzing changes in experiential factors, such as whether a given action would result in a visible change, the duration of any change in the visual character, the distance and viewing conditions under which the change would be visible, and the number of viewers that would be affected

Scenic resources impacts consist of a substantial change that would: (a) change existing landscape character, whether foreground, intermediate ground, or background, and be visible from viewpoints the National Park Service has established as important; (b) change access to historically important viewpoints, or sequence of viewpoints; or (c) change the visibility of an viewpoint or sequence of viewpoints.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts are site-specific to the scenic resource. Therefore, it was assumed that all scenic resource impacts would be local.

Intensity. Impacts are classified as negligible, minor, moderate, or major. The intensity of the impact depends both on the extent of the physical effect and the duration of that effect. A negligible impact would be barely perceptible and would be confined to a limited viewpoint. A minor impact would result in little change in existing landscape character and minor and temporary effects on viewers. A moderate impact would be noticeable to the viewer from one or more scenic viewpoints. A major impact would cause a substantial change in landscape character, a permanent change in access to viewpoints or sequence of viewpoints, or a permanent and substantial effect on visibility of a viewpoint or sequence of viewpoints.

Duration. The duration of the impact considers whether the impact would occur in the short term (e.g., temporary) or the long term (e.g., permanent).

Type of Impact. Impacts were evaluated in terms of whether the impact would be beneficial or adverse to the scenic resource. Beneficial impacts would improve the scenic resource. Adverse impacts would degrade the scenic resource.

Socioeconomics

The impacts analysis evaluated four separate socioeconomic areas, including the social environment, visitor populations, regional economy, and the impacts to primary park concessioner. Separate methodologies have been developed for each of these impact areas.

It is assumed that park overnighers who are potentially displaced from lodging in the park under the action alternatives would instead stay in the gateway communities as local overnighers. It is further assumed that in the short-term, some displaced park overnighers that may wish to lodge overnight in the region (as local overnighers) may be displaced to day excursion visitors due to a lack of lodging capacity in the gateway region, particularly during the peak season. In the long-term, however, it is assumed that the regional lodging market would respond to visitor demand, and those displaced park overnighers would become local overnighers.

Camping facilities are among the in-park accommodations that could be displaced under the action alternatives. Because camping facilities cannot be substantially expanded in the affected region (Madera, Mariposa, Merced, Mono, and Tuolumne Counties), it is assumed that visitors displaced from camping in the park may not find camping accommodations in the affected region and may decide not to visit the park. It is assumed that these displaced visitors could be replaced by those preferring to lodge in a hotel in the affected region, or some displaced campers may select to lodge in the region rather than camp.

Quantitative analysis of potential effects on socioeconomic conditions was not feasible due to the prescriptive nature of the *Merced River Plan*. Rather, analysis of effects was qualitative, and professional judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts (see discussion under Impact Assessment, below). When possible, mitigation measure(s) were incorporated into the *Merced River Plan/FEIS* to reduce the adverse effects of socioeconomic impacts.

Social Environment

This section analyzed potential changes to the social environments of the communities of Yosemite Valley, El Portal, and Wawona, including housing, employee commute, community amenities, and recreational opportunities associated with the application of the management zone prescriptions under each of the action alternatives.

Visitor Populations

The analysis identified potential changes in park visitor accommodations that could result from the application of the management zone prescriptions and assumed implementation of these changes. This section described changes in the composition of Yosemite visitors (e.g., park overnighers, local overnighers, and day excursion visitors) and qualitatively addressed potential changes in visitor spending. This section also identifies impacts to low-income park visitors associated with changes in availability of low-cost recreation activities and low-cost park accommodations.

Regional Economy

This section qualitatively analyzed the impacts of changes in visitor spending and shifts in employment associated with the potential removal of park accommodations and other facilities. Due to the qualitative nature of the analysis, these impacts were addressed in terms of the affected region as a whole, and not at the individual county level.

Concessioner

The analysis identified facilities operated by the primary park concessioner that would be inconsistent with the management zone prescriptions under each of the action alternatives. The analysis assumed that these facilities could be removed, and analyzed the impact on concession revenues.

Impact Assessment

Proposed management prescriptions under the *Merced River Plan/FEIS* were evaluated in terms of the context, intensity, and duration of the socioeconomic impacts, and whether the impacts were considered to be beneficial or adverse to the socioeconomic environment.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or El Portal. Regional impacts would be impacts on the affected region, which is defined in Chapter III, Affected Environment.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on the socioeconomic environment. Minor impacts were effects on the socioeconomic environment that would be slightly detectable but not expected to have an overall effect. Moderate impacts would be clearly detectable and could have an appreciable effect. Major impacts would have a substantial, highly noticeable influence on the socioeconomic environment and could permanently alter the socioeconomic environment.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of activities. A long-term impact would have a permanent effect on the socioeconomic environment.

Type of Impact. Impacts were evaluated in terms of whether the impact would be beneficial or adverse to the socioeconomic environment. Beneficial socioeconomic impacts would improve the social or economic conditions in the park or in the affected region. Adverse socioeconomic impacts would negatively alter social or economic conditions in the park or in the affected region, or would affect low-income populations.

Park Operations and Facilities

Impacts of the *Merced River Plan* and associated actions on and from park operations were determined by examining:

- Direct changes to staffing requirements, and policies associated with park operations
- Indirect effects of park operations staffing, such as effects on utility and roadway infrastructure, flooding, and impacts on provision of utilities, especially potable water and sewer services
- Direct increases in energy use and conservation policies caused by changes in park operations staffing, or policies

Impact Assessment

Proposed management prescriptions under the *Merced River Plan/FEIS* were evaluated in terms of the context, intensity, and duration of impacts to park operations and facilities, and whether the impacts were considered to be beneficial or adverse to park operations and facilities.

Context. The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or El Portal. Regional impacts would be impacts that occur throughout the Sierra Nevada region. For the purposes of this analysis, it was assumed that all impacts would be local.

Intensity. The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and would have no discernible effect on park operations and facilities. Minor impacts were effects on park operations and facilities that would be slightly detectable but not expected to have an overall effect on the ability of the park to provide services and facilities. Moderate impacts would be clearly detectable and could have an appreciable effect on park operations and facilities. Major impacts would have a substantial, highly noticeable influence on park operations and facilities and include those impacts that would reduce the park's ability to provide adequate services and facilities to visitors and staff.

Duration. The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of activities. A long-term impact would have a permanent effect on park operations and facilities.

Type of Impact. Impacts were evaluated in terms of whether they would be beneficial or adverse to park operations and facilities. Beneficial impacts would improve park operations and/or park facilities. Adverse impacts would negatively affect park operations and/or facilities and could impede the park's ability to provide adequate services and facilities to visitors and staff.

Alternative 1: No Action

Alternative 1, the No Action Alternative, represents the current management direction for the Merced River corridor. It is based on the boundaries (see figures II-7 through II-10 in Chapter II, Alternatives), classifications (see figure II-3), and Outstandingly Remarkable Values (see Appendix E) for the Merced River corridor that are currently in place, as published in the 1996 *Draft Yosemite Valley Housing Plan*. The No Action Alternative would not apply a consistent set of decision-making criteria and considerations, which are composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the VERP framework.

Natural Resources

Geology, Geohazards, and Soils

Analysis

General Impacts. The following discussion provides an overview of the types of geologic impacts that could occur within the Merced River corridor from application of Alternative 1.

Rockfall Hazards. Under Alternative 1, the potential for adverse impacts to visitors and park facilities from unstable rock slopes, seismic events, and soil erosion would not change. Mass movement from unstable rock slopes would continue to result in rockfalls, debris flow, and rock avalanches, exposing visitors to potential injury and facilities to damage. Rockfalls can be expected throughout Yosemite National Park in any area that has steep rock cliffs. Along the Merced River, rockfalls can occur in the upper wilderness reaches, along the edges of Yosemite Valley, within the Merced River gorge, and along the South Fork where the river is contained within canyons. Most rockfalls are associated with triggering events such as earthquakes, climatic changes such as rainfall events, or gradual stress release and exfoliation of the granite. Any injury to visitors and damage to facilities from rockfall hazards are most likely to occur in the developed valley and canyon areas of the Merced River and South Fork corridor, such as Yosemite Valley, the Merced River gorge along El Portal Road, El Portal Administration Site, and possibly in Wawona. Although rockfalls do occur throughout Yosemite National Park, their risk to visitors and facilities is considered low in the less-traveled and undeveloped wilderness areas. Facilities located within proximity to the talus zone or within the rockfall shadow zone are most susceptible to damage from rockfalls. Rockfall frequency can be yearly to every several decades; risks posed by rockfalls include casualties and structural damage. Avoiding all rockfall-related risk is not possible, especially in narrow, steep valleys or canyons. The configuration of the Yosemite Valley walls and relatively narrow canyons suggest there are no “safe” areas within areas susceptible to rockfall risks (Wieczorek, et al. 1998).

Seismic Hazards. Historically, seismic events in the Sierra Nevada and Yosemite National Park have been relatively infrequent; however, when they do occur, the resultant groundshaking is capable of triggering rockfalls and producing ground accelerations that are higher than some

older, less structurally stable buildings can tolerate. Typically, the seismic risks of injury to visitors and damage to facilities would occur in the developed portions of Yosemite National Park, such as Yosemite Valley, El Portal, and Wawona. In these areas, buildings and other facilities placed within saturated alluvial soil (for instance, within the floodplain of the Merced River) could also be susceptible to secondary hazards from seismic groundshaking, including liquefaction and seismically induced settlement. Earthquakes in the Sierra Nevada region would continue to expose visitors to injury in unstable buildings or to hazards caused by seismically triggered mass movement from rock slopes. In the upper wilderness reaches of the Merced River, Yosemite Valley, the Merced River gorge, and along the river canyons of the South Fork, earthquakes could trigger rockfalls and subject the area to seismic shaking. In Yosemite Valley and in Wawona on the South Fork, seismic shaking could also be responsible for instability of certain alluvial soils. Buildings and other facilities placed within saturated alluvial soil would continue to be susceptible to secondary hazards from seismic shaking, including liquefaction and seismically induced settlement. Emergency preparedness systems developed to respond to natural disasters within areas of heavy visitor use would remain in place.

Impacts to Soils. Possible projects to accommodate increased visitor use in development zones could result in increased soil compaction, soil loss, and erosion. Compaction of native soils can occur through construction activity, concentrated visitor use in localized areas, or excessive vehicular traffic in unpaved areas. Construction excavation and replacement of native soils with engineered fills contribute to the reduction of local native soil. Excessive surface water runoff or loss of protective vegetation cover can cause erosion. Facilities placed in areas susceptible to damage from erosion and settlement would remain in their current locations. Current use of well-developed and well-traveled areas within the park would continue to cause erosion and compaction. Continued river access would result in increased erosion, removal of vegetation, and decreased soil stability. Construction and maintenance projects in the Merced River corridor would continue to occur and result in soil removal and soil matrix mixing. Fluvial mechanics resulting in bank erosion and loss of bank soil would also continue.

Under Alternative 1, the National Park Service could retain (and revise) current management policies pertaining to geologic resources and hazards. Policies include those implemented to protect visitors and reduce damage to park infrastructure. Although it is currently park policy to allow natural geologic processes to proceed unimpeded, the National Park Service, in cooperation with the U.S. Geological Survey, would continue to address geohazards in its planning and management activities to minimize the potential impact on park visitors and facilities. The National Park Service would continue the practice of conducting site-specific geologic analyses prior to the construction of buildings and other facilities to determine potential soil instability. Although rockfalls and earthquakes are unavoidable, and rockfalls are not always predictable in many locations within Yosemite National Park, the National Park Service would continue to avoid locating facilities in areas where current studies indicate such facilities could be affected by geologic events.

Summary of Alternative 1 Impacts. Considering the unpredictable and unavoidable nature of rockfalls and earthquakes and the history of their occurrence, there would be long-term, adverse impacts on public safety from geohazards. Continued development under Alternative 1 would

result in a long-term, adverse impact on soil resources, as future projects and visitor use would result in further compaction, soil removal, and erosion.

Cumulative Impacts

Cumulative impacts to geological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect geological resources within the river corridor or in the park vicinity.

Various reasonably foreseeable future actions could eventually result in construction of additional structures and facilities within zones susceptible to adverse impacts from earthquakes and rockfall. These facilities would likely be located in developed areas, including Yosemite Valley, the El Portal Administrative Site, and Wawona.

Past Actions. Development projects intended to serve park visitors in Yosemite National Park have included hotels, visitor centers, campgrounds, and bridges with associated roads and parking lots. In addition, facilities required for park infrastructure support, including employee housing, utility facilities, maintenance yards, and supply storage areas, have been developed throughout the park. As popularity of Yosemite attracted a greater number of visitors, the number and magnitude of these projects increased to meet visitor demand. Past actions have resulted in adverse impacts because projects were developed in areas that could be susceptible to damage from geohazards (rockfalls and seismic events), and facility development has contributed to the overall degradation of soil resources in the park.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects geology, geohazards, and soils. The reconstruction requires steepening the sheer rock slopes along the north side of the roadway, which increases the potential for rockfalls over the short term (stability of the rock slopes). However, under the direction of engineers, design features for rock cuts along the El Portal Road (e.g., rock-bolting using 30-foot-long dowells) serve to increase the long-term stability of the rock slopes. These design features are also used to stabilize colluvial soil cuts, thereby reducing erosion. On the south side of the El Portal Road, shoulder widening requires construction of a fill slope that, in certain areas, encroaches into the Merced River. These effects are partially mitigated by implementation of standard design and construction-related best management practices. The project also involves rehabilitation of the sewerline which reduces potential soil contamination, and the improvement of roadway drainage, thereby reducing erosion. The encroachment of the fill slope into the Merced River would cause

minor obstruction to the free-flowing condition of the river. Overall, the El Portal Road Reconstruction (Segment D) Project would have a beneficial impact by reducing rockfall and soil erosion potential.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on geohazards and soil resources include:

- Several campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS), both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- Transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., potential short-term construction erosion and soil loss), an objective of each of these projects is to restore and manage natural resources and reduce soil degradation. Therefore, these projects could have a net long-term, beneficial, cumulative impact on soil resources.

Reasonably foreseeable projects that could have both adverse and beneficial effects on regional geology, geohazards, and soils include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and White Wolf Water System Improvements (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Wawona Campground Improvement (NPS)
- Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

Cumulative effects of the above-referenced projects could be a combination of adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term benefit on soil resources by increasing coordinated management of natural resources. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project above Cascades Diversion Dam). The current approach for the Segment D widening would require redesign. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., steepening of sheer rock slopes, potentially leading to short-term slope instability, and traffic circulation, safety, and noise impacts). The net effect of these projects is difficult to anticipate, but would likely result in an overall balance between beneficial and adverse effects.

Reasonably foreseeable projects that could have an adverse effect on regional geology, increase the potential for impacts related to geologic hazards, and increase soil degradation include:

- Merced River Canyon Trail Acquisition (BLM)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Build Out City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak).

Certain development projects, as listed above, could expose additional visitors to risk of rockfall and seismic hazards and result in increased degradation of soil resources. Examples of projects that would result in a cumulative increase in park development include the construction of South

Entrance/Mariposa Grove Site Planning (NPS), a new Resources Management Building (NPS), Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.), and the El Portal Road Reconstruction Project (NPS).

Given that hazards related to geologic processes are unavoidable and unpredictable, park visitors would continue to be exposed to injury and damage from earthquakes and rockfalls. This would result in a cumulative, long-term, adverse impact to public safety. The cumulative effect of future development actions under Alternative 1 would be to increase the overall depletion of soil resources by increasing soil removal, compaction, and erosion. Restoration projects could offset the rate of overall soil resource depletion, but not to the extent of providing a cumulative benefit. Future development projects would result in a cumulative, long-term, adverse impact on soil resources.

Rockfall hazards under Alternative 1 and the cumulative projects would result in a long-term, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, continued development under Alternative 1 could locate facilities in areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury and damage; therefore, Alternative 1 and the cumulative projects would have no impact on public safety with respect to seismic hazards. Impacts on soil resources under the cumulative projects would be long term and adverse. Overall, Alternative 1 and the cumulative projects would have a long-term, adverse impact on public safety from rockfalls and earthquakes and a long-term, adverse impact on soil resources.

Conclusions

Considering the unpredictable and unavoidable nature of rockfalls and earthquakes and the history of their occurrence, there would be a long-term, adverse impact on public safety from geohazards. Continued development under Alternative 1 would result in a long-term, adverse impact on soil resources, as future projects and visitor use would result in further compaction, erosion, and soil removal.

Rockfall hazards under Alternative 1 and the cumulative projects would result in a long-term, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, continued development under Alternative 1 could locate facilities in areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury and damage; therefore, Alternative 1 and the cumulative projects would have no impact on public safety with respect to seismic hazards. Impacts on soil resources under the cumulative projects would be long term and adverse. Overall, Alternative 1 and the cumulative projects would have a long-term, adverse impact on public safety from rockfalls and earthquakes and a long-term, adverse impact on soil resources.

Hydrology, Floodplains, and Water Quality

Analysis

General Impacts. Under Alternative 1, hydrology, floodplain, and water quality conditions of the Merced River would remain as they are today, and future conditions would reflect current management practices and projected visitor levels. Degradation of free-flow river conditions, the adjacent floodplains, and overall water quality would continue.

The following discussion provides an overview of the types of impacts to wetland resources that could occur within each segment of the Merced River corridor from application of Alternative 1.

Impacts in Wilderness. Hydrologic-process Outstandingly Remarkable Values within wilderness segments of the main stem and South Fork of the Merced River include steep river gradients, glaciers, excellent water quality, logjams, and continual white-water cascades. Hydrologic processes of the wilderness reaches of the Merced River are generally intact, except where facilities exist and human use is intense (e.g., in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes). Under Alternative 1, use of these facilities could continue consistent with existing conditions. Hydrologic processes (e.g., water quality) would continue to be negatively affected by development and by human and stock use at these locations. Existing development would continue to adversely affect floodplain characteristics (e.g., water recharge rates, floodwater dissipation). Types of adverse effects associated with continued human and stock use include site-specific degradation of water quality (e.g., refuse, fecal coliform bacteria, human- and stock-induced erosion). Water quality is also positively affected by localizing facility- and use-related impacts and by providing toilets and other facilities designed to minimize adverse effects. Minor footbridges and other obstructions would continue to restrict the free-flow condition of the river and subsequently alter stream processes that define channel characteristics. These continued actions could have long-term, site-specific, adverse effects on wetland and riparian resources in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes, while hydrologic processes throughout the river corridor would continue to benefit from concentration of these facility- and use-related effects. In all other areas of the wilderness reaches of the Merced River, continued use of existing facilities (e.g., trails) at a similar level of intensity is not expected to affect hydrologic processes.

Impacts in Yosemite Valley. Hydrologic-process Outstandingly Remarkable Values within Yosemite Valley include world-class waterfalls, the 100-year flood regime, oxbows, and Mirror Lake, an example of a transitory lake. Under Alternative 1, impacts on river characteristics (such as channel shape and sinuosity) stemming from inadequately designed bridges and development in the Merced River corridor would continue. Bridges and other obstructions would continue to restrict the free-flow condition of the river and subsequently alter stream processes that define channel characteristics. These impacts to the natural flow of the river are apparent all along the corridor. These obstructions contain the river in its existing channel within local reaches by restricting free-flow dynamics and the ability of the river to naturally discharge and dissipate

channel-forming flows or flood flow. The streamflow would continue to be permanently altered and would adversely affect the Outstandingly Remarkable Values associated with the free-flowing nature of the river. This impact is expected to worsen over time, resulting in a minor to major (depending on site-specific conditions), long-term, adverse effect at various points along the river corridor.

The Merced River floodplain has been negatively affected by past development within the river corridor. Floodplain alterations are concentrated in areas, such as east Yosemite Valley. Structural and recreational development, resulting in impervious surfaces, creation of flow barriers, and loss of vegetative cover, have altered floodplain characteristics and the interaction between the floodplain and high flows of the river. Fill material and protective measures used to make areas within the floodplain more suitable for development have limited the geomorphic diversity and ability of the floodplain to dissipate energy during peak discharge flows. Under Alternative 1, the 100-year flood regime and floodplain formation and evolution, which are Outstandingly Remarkable Values of the river, would continue to be adversely altered.

Visitor use of the river corridor also would continue to have an impact on bank stability and floodplain areas, resulting in continued changes to channel and floodplain morphology. Visitor use would continue to affect the floodplain by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Modifications to the river channel and floodplain (through soil compaction, loss of riparian vegetation, and accelerated erosion) influence important stream characteristics such as riffle/pool complexes, substrate type, channel migration, and riparian cover. These physical aspects often determine the composition of vegetative and aquatic communities that compose the riparian corridor and floodplain. The continued use of streambanks and floodplains by park visitors would adversely affect floodplains in the Merced River corridor, especially in areas of concentrated use such as east Yosemite Valley. This effect would worsen over time as visitor use increases. This would constitute a long-term, adverse impact.

Roadways, structures, and visitor use areas would continue to be present in the floodplain and would be subject to flood hazards under Alternative 1. Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines* provide guidance for the protection of natural floodplain values and of life and property in the National Park System. For future structures, the National Park Service must avoid construction of facilities in a floodplain if alternative locations are available. Where no alternatives exist, policies allow construction of structures, such as day-visitor parking lots, picnic areas, and campgrounds, if risks to human life and property are studied and then minimized or mitigated through design. The *Floodplain Management Guidelines* require medical facilities, schools, and fuel storage areas to be placed outside the 500-year floodplain. Therefore, under Alternative 1, existing flood hazards could remain, whereas future flood hazards would be precluded or mitigated for potential facility construction in the floodplain.

Merced River water quality is degraded through the introduction of refuse, fecal coliform bacteria, and other human-associated pollutants from intensive visitor use of streambanks and the floodplain. Development and visitor impacts in riparian zones also influence critical water quality elements such as water temperature, suspended sediments, and nutrients. These elements interact

in complex ways in aquatic systems and directly and indirectly influence patterns of growth, reproduction, and migration of aquatic organisms. Intensive visitor use would continue to degrade the channel slopes and the riparian corridor, thereby increasing water temperatures and suspended sediment and reducing dissolved oxygen levels. Such changes to the physical characteristics of the river can be harmful to aquatic organisms, riparian vegetation, and water supply uses. These types of changes occur as the channel widens, flattens, and becomes shallower in reaction to the destabilization and degradation of streambanks caused by human activities. These activities are focused in developed and high-use areas, particularly in east Yosemite Valley. Intensive visitor use would continue the long-term degradation of Merced River water quality.

Roads, parking lots, and other impervious surfaces in or near the corridor would continue to release nonpoint-source pollutants into stormwater runoff that would subsequently discharge to the Merced River and its tributaries. These pollutants adversely affect the water quality of the Merced River. Impervious surfaces such as roads and parking lots accumulate automobile-related pollutants that are easily transported to adjacent or nearby water resources through stormwater runoff. Such surfaces also accumulate refuse and other pollutants discarded by park visitors that can be transported to nearby water resources. Roads, parking lots, and other impervious surfaces would continue the long-term degradation of Merced River water quality.

Maintenance associated with existing facilities within the Merced River corridor could result in localized, short-term adverse impacts on water quality by introducing construction-related pollutants (eroded soils, fuels, building materials). These pollutants could be transported to the river corridor through stormwater runoff. Implementation of current management practices would help reduce potential short-term impacts on water quality due to maintenance activities.

Impacts in the Merced River Gorge and El Portal. Facilities and visitor use in the majority of the Merced River gorge are minimal due to topography and access. Water quality and the hydrologic processes of the Merced River would continue to be affected by existing facilities, roads, pullouts, contaminated stormwater runoff, and riprap. Cascades Diversion Dam would continue to adversely affect the free flow of the Merced River (site-specific, major, long-term, and adverse). Roads, parking lots, and other impervious surfaces in or near the corridor could continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to the Merced River. Impervious surfaces accumulate automobile-related pollutants, refuse, and other nonspecific pollutants that are easily transported to adjacent or nearby wetland resources through stormwater runoff. These continued effects would be considered adverse and long term. A bulk storage facility for petroleum fuels and a gas station would continue to be located in El Portal, and the transportation of fuels would continue in the corridor. The risk of a fuel release would remain, but would be mitigated by compliance with standard regulatory requirements for the transportation and storage of such materials and normal park operation and maintenance procedures. A release of fuel would constitute a short-term, adverse impact to water quality of the Merced River.

Hydrologic-process Outstandingly Remarkable Values in the Merced River gorge and El Portal include continuous rapids and the transition from a mature river in Yosemite Valley to a young river in the gorge. Alternative 1 would have no impact on these Outstandingly Remarkable Values.

Impacts in Wawona. Under Alternative 1, hydrology, floodplains, and water quality in Wawona could continue to be affected by facilities and visitor use. Existing development (e.g., Wawona Campground, the Wawona maintenance facility) would continue to adversely alter floodplain characteristics. The Wawona maintenance facility would continue to pose a threat to water quality of the South Fork (a hydrologic-process Outstandingly Remarkable Value). The risk of hazardous materials release would remain, but would be mitigated by compliance with standard regulatory requirements for the transportation and storage of such materials and normal park operation and maintenance procedures. A potential release of fuel or other hazardous material would constitute a short-term, adverse impact to water quality of the South Fork.

Under Alternative 1, impacts on river characteristics (such as channel shape and sinuosity) stemming from inadequately designed bridges and development would continue. Wawona Bridge and other obstructions would continue to restrict the free-flow condition of the river and subsequently alter stream processes that define channel characteristics. This impact is expected to worsen over time, resulting in a long-term, adverse effect at specific locations along the South Fork.

Visitor use would continue to degrade the channel slopes and the riparian corridor, thereby increasing water temperatures and suspended sediment and reducing dissolved oxygen levels. Such changes to the physical characteristics of the river can be harmful to aquatic organisms, riparian vegetation, and water supply uses. These types of changes occur as the channel widens, flattens, and becomes shallower in reaction to the destabilization and degradation of streambanks caused by human activities. These activities are focused in developed and high-use areas. Visitor use would continue the long-term degradation of South Fork water quality.

Summary of Alternative 1 Impacts. Development and visitor use in the Merced River corridor have affected water resources, the reliant biological communities, and the natural evolution of the river. Under Alternative 1, the continued and potentially worsening substantial alterations of streamflow and floodplains would be a long-term, adverse impact, and the continued degradation of water quality would be a long-term, adverse impact. These effects would be most pronounced in areas with concentrated facilities and visitor use (e.g., Yosemite Valley, El Portal, Wawona). National Park Service administrative requirements do afford some protection to the river from future actions, but no comprehensive or unified plan exists to protect the hydrology, floodplains, water quality, and related Outstandingly Remarkable Values of the Merced River.

Cumulative Impacts

Cumulative effects to hydrology discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect the watershed of the Merced River.

Past Actions. The Merced River has been historically affected by a variety of projects that have introduced obstructions into the river channel, modified the floodplain, and adversely affected water quality. Alterations to hydrology have occurred through development and use within the Merced River corridor since Euro-American settlement. Examples of projects that have had

adverse effects on the hydrologic processes of the Merced River include bridges, riprap, removal of large woody debris, dikes, flood walls, impoundments, dams, and buildings.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects the water quality of the Merced River immediately adjacent to the roadway. The free-flowing condition of the Merced River has been adversely altered by direct placement of fill and riprap to widen and stabilize the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and by excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and in other parts of the river corridor. Implementation of these measures reduces the overall short-term effects on water quality.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; (3) projects anticipated to have a net adverse effect; and (4) projects that would not affect the hydrological processes of the Merced River.

Examples of projects that could have a cumulative, beneficial effect on hydrological processes in the Merced River include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- South Fork Merced River Bridges Replacement (NPS)

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects on water quality), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems.

Therefore, the net cumulative effect of these projects would be a long-term, beneficial impact on hydrological processes of the Merced River.

A reasonably foreseeable project that could have mixed adverse and beneficial effects on hydrological processes includes:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* has the potential to positively affect free flow of the Merced River by the proposed removal of the Cascades Diversion Dam. The *Yosemite Valley Plan* also has the potential to adversely affect water quality during construction activities related to Segment D of the El Portal Road Reconstruction Project (short-term), with the long-term, beneficial effect of improving water quality. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., effects to water quality). Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on hydrological processes include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Yosemite Motels, El Portal (Mariposa Co.)

Cumulative effects of these potential future projects on the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. However, cumulative adverse effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term and adverse.

Conclusions

Development and visitor use in the Merced River corridor have affected water resources, the reliant biological communities, and the natural evolution of the river. Under Alternative 1, the continued and potentially worsening substantial alterations of streamflow and floodplains would be a long-term, adverse impact, and the continued degradation of water quality would be a long-term, adverse impact. These effects would be most pronounced in areas with concentrated facilities and visitor use (e.g., Yosemite Valley, El Portal, Wawona). National Park Service administrative requirements do afford some protection to the river from future actions, but no comprehensive or unified plan exists to protect the hydrology, floodplains, water quality, and related Outstandingly Remarkable Values of the Merced River.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. However, cumulative adverse effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term and adverse.

Wetlands

Analysis

General Impacts. Wetlands and riparian areas are relatively rare in the context of the entire landscape. When wetlands are converted to systems that are intolerant of flooding (drained agricultural lands, filled developed lands), their storage capacity decreases and downstream flooding increases (National Academy Press 1993, as in NPS 1997g). Modification of even small wetland areas induces effects that are proportionally greater than elsewhere in an ecosystem (Graber 1996).

The following discussion provides an overview of the types of impacts to wetland resources that could occur within each segment of the Merced River corridor from application of Alternative 1.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Wetland and aquatic habitats of the wilderness reaches of the main stem of the Merced River are generally intact, except where visitor use is intense (e.g., in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes). Under Alternative 1, use of these facilities would continue consistent with existing conditions. Wetland and aquatic habitats at these locations would continue to be negatively affected by existing development and by visitor and stock use. Existing development would adversely affect wetland and aquatic habitats, primarily through habitat fragmentation and the imposition of unnatural barriers to plant and wildlife movements (barriers in turn affect seed sources, nutrients, and plant distribution patterns). Types of adverse effects associated with continued visitor and stock use include site-

specific degradation of water quality (e.g., refuse, fecal coliform bacteria, and other visitor- and stock-associated pollutants), potential introduction or spread of noxious weeds (primarily by stock), and grazing, trampling, compaction and erosion, which would result in the loss of natural structure, diversity, and productivity. Wetlands and aquatic habitats are also positively affected by localizing facility- and use-related impacts away from wetlands. These continued actions would have long-term, site-specific, adverse effects on wetland and riparian resources in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes, while wetlands overall throughout the river corridor, would continue to benefit from concentration of these facility- and use-related effects. In all other areas of the wilderness reaches of the main stem of the Merced River, continued use of existing facilities (e.g., trails) at a similar level of intensity is not expected to affect wetland and aquatic communities. No specific wetland features of the wilderness reaches of the Merced River are identified as an Outstandingly Remarkable Value. Therefore, none would be affected by this alternative.

Impacts in Yosemite Valley. Under Alternative 1, size, structure, productivity, and continuity of wetland (within wetland and between wetland and riverine habitat) and aquatic habitats within Yosemite Valley would continue to be affected by existing facilities and visitor use.

Facilities such as roads, bridges, and ditches would continue to drain wet meadows, fragment the floodplain, and have adverse effects on wetland and aquatic habitats by imposing unnatural barriers to plant and wildlife movements. These in turn may accelerate drying of wetland habitats and conifer encroachment of wet meadow and riparian communities. Roads, parking lots, and other impervious surfaces in or near the corridor would continue to release nonpoint-source pollutants into stormwater runoff that would subsequently discharge to low-lying wetlands and the aquatic habitat of the Merced River and its tributaries. Impervious surfaces accumulate automobile-related pollutants, refuse, and other nonspecific pollutants that are easily transported to adjacent or nearby wetland resources through stormwater runoff.

General visitor-related effects include trampling, litter, erosion, compaction, and the unintentional introduction and spread of non-native plants and wildlife. It is anticipated that visitor demand and use of the park (overall) would increase and would continue to affect floodplain wetlands and the aquatic habitat of the Merced River by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Modifications to the river channel and floodplain (through soil compaction, loss of riparian vegetation, and accelerated erosion) influence important stream characteristics such as riffle/pool complexes, substrate type, water quality, channel migration, and riparian and wet meadow cover. Along some stretches of the Merced River in eastern Yosemite Valley, river banks are largely denuded, affecting shading and nutrient dynamics in aquatic habitats. These effects may combine to accelerate bank erosion and widening of the Merced River (i.e., the channel could widen, flatten, and become shallower in reaction to the streambank destabilization caused by visitor use and trampling), increase water temperature, increase suspended sediment, and reduce dissolved oxygen levels. Such changes to the physical characteristics of the river would be harmful to aquatic organisms, and riparian and wetland vegetation. Although these activities are focused in developed and high-use areas, particularly in east Yosemite Valley, the effect on wetlands and the aquatic habitat of the Merced River is felt throughout Yosemite Valley. The impact of existing facilities and visitor use within Yosemite

Valley under Alternative 1 could escalate as time passes and the continued effects become worse. Overall, continued habitat degradation would result in a long-term, adverse impact to wetland and aquatic habitats (a biological resource Outstandingly Remarkable Value) within Yosemite Valley.

Impacts in the Merced River Gorge and El Portal. Direct visitor intrusion into the majority of riparian areas of the Merced River gorge is minimal due to topography. The riparian zone would continue to be affected by facilities, roads, pullouts, contaminated stormwater runoff, non-native species, use of non-motorized watercraft (and associated visitor trampling at launch and removal locations), and riprap. Cascades Diversion Dam would remain and continue to affect the aquatic environment of the Merced River. Roads, parking lots, and other impervious surfaces in or near the corridor would continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to the aquatic habitat of the Merced River. Impervious surfaces accumulate automobile-related pollutants, refuse, and other nonspecific pollutants that are easily transported to adjacent or nearby wetland resources through stormwater runoff. The riparian community through the Merced River gorge, identified as an Outstandingly Remarkable Value, would continue to be affected by use of the El Portal Road (and associated pollutants) and non-native species. These continued effects would be considered adverse and long term.

Impacts in Wilderness Segments of the South Fork. Adverse effects to wetland and aquatic resources of the wilderness segments of the South Fork are generally associated with facilities (existing and proposed) and visitor and stock use. No facilities (other than a few trails) currently occur in the upper (above Wawona) and lower (below Wawona) portions of the South Fork, access is difficult, and visitor and stock use is low. The only perceptible change anticipated under Alternative 1 would be an increase in overall visitors to the park, which may increase pressure on relatively unused portions of the South Fork. Although increased visitor use of the upper and lower reaches of the South Fork would negatively affect wetland and aquatic habitats by increasing erosion, soil compaction, trampling, and refuse; decreasing water quality and vegetative cover; and through the potential introduction of non-native species, topography would continue to limit the majority of visitors that can access these portions of the South Fork. No specific wetland features of the upper or lower South Fork are identified as an Outstandingly Remarkable Value. Therefore, none would be affected by this alternative.

Impacts in Wawona. Under Alternative 1, wetland and aquatic habitats within Wawona would continue to be affected by existing facilities and visitor use. Size, structure, productivity, and continuity (within wetland and between wetland and riverine habitat) would continue to decrease due to conifer encroachment, visitor trampling, spread of non-native species, continued use of existing development, and loss of natural drainage patterns due to roads and diversions.

Visitor use would continue to affect the wetlands and the aquatic habitat of the South Fork by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion as described above. Roads, parking lots, and other impervious surfaces in or near the corridor would continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to low-lying wetlands and the aquatic habitat of the South Fork. The anticipated overall increase in visitors to the park may increase pressure on relatively unused portions of the South Fork in the vicinity of Wawona, including Wawona Meadow, a biological resource Outstandingly Remarkable Value.

The ongoing effect of habitat degradation and the foreseeable increase in visitors would result in site-specific, long-term, adverse effects to wetland and riparian habitats of the central South Fork and Wawona.

Summary of Alternative 1 Impacts. Development and visitor activity in the Merced River corridor have affected wetland and aquatic resources. Existing facilities and visitor use under Alternative 1 would result in the continued degradation and further impact on the size, structure, productivity, and continuity of wetland and aquatic habitats. Existing facilities would continue to alter natural habitat and ecosystem patterns. Visitor use and the projected increase in park visitors would continue to cause adverse effects, such as trampling, erosion, and compaction. The combined effects of visitor use and existing facilities would lead to additional alterations in vegetation patterns (e.g., conversion of wet meadow to conifer forest) and modifications to the river channel and floodplain (e.g., channel widening). The National Park Service would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Yosemite Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements to wetland and aquatic resources on an ad-hoc basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and re-establishment of wetlands would continue on a site-by-site basis rather than a parkwide or Valleywide basis. Overall, effects would escalate as time passes and the continued effects worsen. These effects would be concentrated in areas of high visitor use, such as Yosemite Valley and in the vicinity of major trails. In areas of little use (for example a majority of the wilderness reaches of the Merced River, and the upper and lower portions of the South Fork), continued use of existing facilities (e.g., trails) at a similar level of intensity would have no noticeable effects on wetland and aquatic communities.

Cumulative Impacts

Cumulative effects to wetland and aquatic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wetland patterns (i.e., within the river corridor) as well as large-scale or regional wetland patterns.

Past Actions. Aquatic and riparian systems are the most altered and impaired habitats of the Sierra Nevada and are relatively rare in the context of the entire landscape. Wetlands in the Sierra Nevada have been drained since the earliest settlers attempted to “reclaim” meadows and other seasonally wet areas. Mountain meadows were commonly drained with the intent of improving forage conditions and to permit agriculture (Hughes 1934, as in NPS 1997b, University of California, Davis 1996). Development and activity in Yosemite National Park has reduced historic wet meadow acreage by 60-65%. Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, agriculture, buildings, campgrounds, and recreational features. Dams and diversions throughout most of the range have profoundly altered stream-flow patterns and water temperatures. Within the mountains, broad valleys with wide riparian areas were often reservoir sites, and much of the best former riparian habitat in the Sierra Nevada is now under water. The extent of the inundation across the range becomes apparent when one realizes that virtually all flatwater on the western slope of the Sierra

Nevada below 5,000 feet is artificial (University of California, Davis 1996). These past actions have had long-term adverse effects on regional wetland and aquatic habitats.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wetlands of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wetlands include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park

- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, and Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- South Fork Merced River Bridges Replacement (NPS)

Although each of these projects may have site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wetlands. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wetland resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example is the update to the *Yosemite Wilderness Management Plan*, which could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wetlands include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term, beneficial impact to wetland resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature riparian vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on regional wetlands include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional growth. Each of the aforementioned projects has the potential to have site-specific, adverse effects on wetland and aquatic resources during construction (short-term) and by direct displacement of resources (long-term). Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to wetland and aquatic resources, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement.

Wetland and riparian systems of the Merced River and the Sierra Nevada have been substantially altered by development and visitor activities. These changes have negatively influenced wetland size, form, and function and the plants, wildlife, and aquatic species that inhabit them. Cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wetlands include wetland restoration, rehabilitation projects, and ecosystem management. Cumulative adverse effects would be related to past, present, and reasonably foreseeable increased facilities, regional growth, and visitor demand. Several of these cumulative actions could have a long-term, beneficial effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor. However, throughout the Sierra Nevada and larger region, regional development and growth could have a net long-term, adverse effect on regional

wetland and aquatic resources that would not be compensated by local or regional planning and restoration projects. Therefore, cumulative adverse effects on regional wetland and aquatic habitats due to past, present, and reasonably foreseeable actions, could be major, adverse, and long term.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 1 could have a net long-term, adverse effect on regional wetland patterns.

Conclusions

Development and visitor activity in the Merced River corridor have affected wetland and aquatic resources. Existing facilities and visitor use under Alternative 1 would result in the continued degradation and further impact on the size, structure, productivity, and continuity of wetland and aquatic habitats. Existing facilities would continue to alter natural habitat and ecosystem patterns. Visitor use and the projected increase in park visitors would continue to cause adverse effects, such as trampling, erosion, and compaction. The combined effects of visitor use and existing facilities would lead to additional alterations in vegetation patterns (e.g., conversion of wet meadow to conifer forest) and modifications to the river channel and floodplain (e.g., channel widening). The National Park Service would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements to wetland and aquatic resources on an ad-hoc basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and re-establishment of woodlands would continue on a site-by-site basis rather than a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place under current direction, “reactive” resource management is not always effective at protecting sensitive resources over the long term. Overall, effects would escalate as time passes and the continued effects worsen. These effects would be concentrated in areas of high visitor use, such as Yosemite Valley and in the vicinity of major trails. In areas of little use (for example a majority of the wilderness reaches of the Merced River, and the upper and lower portions of the South Fork), continued use of existing facilities (e.g., trails) at a similar level of intensity would have no noticeable effects on wetland and aquatic communities.

Although cumulative actions could have a long-term, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be

compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 1 could have a net long-term, adverse effect on regional wetland patterns.

Vegetation

Analysis

General Impacts. The following discussion provides an overview of the types of impacts to vegetation resources that could occur within each segment of the Merced River corridor from application of Alternative 1.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Vegetation of the upper Merced River is generally intact, except where visitor use is intense (e.g., in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes). Under Alternative 1, use of these facilities would continue consistent with existing conditions. Vegetation at these locations would continue to be negatively affected by development and human and stock use. Existing development would adversely affect vegetation primarily through habitat fragmentation and imposing unnatural barriers to plant and wildlife movements (barriers in turn affect seed source, nutrients, and plant distribution patterns). It is anticipated that annual day use of easily accessible wilderness areas (e.g., the trail to Half Dome) could increase with the projected increase in visitor demand. Types of adverse effects associated with continued human and stock use would include site-specific degradation of water quality (e.g., refuse, fecal coliform bacteria, and other human- and stock-associated pollutants), potential introduction or spread of noxious weeds, and grazing, trampling, compaction and erosion, resulting in loss of natural structure, diversity, and productivity. Vegetation resources are also positively affected by localizing facility- and use-related impacts away from more sensitive areas. These continued actions would have long-term, site-specific, adverse effects on vegetation in the vicinity of facilities and areas of concentrated use.

The degree to which vegetation communities would be affected depends on their position relative to facilities and use as well as sensitivity to perturbation. Riparian, chaparral, and forest communities in close proximity to Merced Lake High Sierra Camp and Backpackers Campground, Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground and major trail routes would experience site-specific, adverse effects. In all other areas of the upper main stem of the Merced River, continued use of existing facilities (e.g., trails) at a similar level of intensity would have no-net adverse effects on vegetation. Examples of vegetation related Outstandingly Remarkable Values of the upper Merced River include exceptional stands of western juniper and white fir. Although stands of each are adjacent to trails, use of these trails on an annual basis is considered low when compared to high-use trails, such as the trail to Half Dome within Little Yosemite Valley. As such potential effects to these Outstandingly Remarkable Values is considered low under Alternative 1.

Impacts in Yosemite Valley. Under Alternative 1, size, structure, productivity, and continuity (within habitat and between habitats) of vegetation within Yosemite Valley would continue to be affected by existing facilities and visitor use.

Existing facilities, such as roads, bridges, ditches, structures, and campgrounds, would continue to affect vegetation (e.g., roads would continue to drain wet meadows, landscape irrigation would continue to affect native oaks, fire suppression in the vicinity of structures would continue to affect vegetative patterns), fragment connection to the floodplain and have adverse effects on vegetation by imposing unnatural barriers to plant and wildlife movements. Fire management near developed areas would not change under Alternative 1, resulting in continued conifer encroachment into adjacent communities (e.g., oak woodlands, wet meadows, and riparian woodlands). Lack of fire has generally resulted in dense overgrown understory and a shift in species composition to more shade-tolerant coniferous species such as white fir, Douglas-fir, and incense-cedar. Although upland communities would continue to expand and become more continuous through Yosemite Valley, forest health is expected to decline. Summer watering of California black oaks in landscaped areas would continue to contribute to the overall decline of this community in Yosemite Valley by promoting the spread of *Armillaria mellea*, a fungus that causes root and crown rot of disturbed or severely stressed oaks. The unnaturally dense stands of incense-cedar and ponderosa pine would continue to contribute to the spread of annosus root rot through much of the developed eastern portion of Yosemite Valley (e.g., Upper River and Lower River Campgrounds, Yellow Pine Picnic Area, portions of Yosemite Lodge, and most of the Taft Toe area).

General human-related effects include trampling, unintentional introduction and spread of non-native species (both plant and wildlife), litter, erosion, and compaction. It is anticipated that overall visitor demand and use of the park would increase. Visitor use would continue to affect vegetation by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Modifications to the river channel and floodplain (through soil compaction, loss of riparian vegetation, and accelerated erosion) influence important stream characteristics that may combine to accelerate widening of the Merced River and alter overall vegetative patterns in Yosemite Valley. Trampling and visitor use would continue to adversely affect understory vegetation, introduce and spread non-native species, and impede natural regeneration of native oaks, woody shrubs, and riparian and meadow vegetation.

In general, the ongoing effect of habitat degradation combined with continued visitor use and the foreseeable increase in visitors would aggravate these effects and result in long-term, adverse effects to vegetation within Yosemite Valley. Examples of vegetation-related Outstandingly Remarkable Values within Yosemite Valley include extraordinary examples of the California black oak community, riparian communities, and overall species diversity. These Outstandingly Remarkable Values also would be adversely affected (long-term) by habitat fragmentation, increased conifer dominance, disease, and effects related to facilities and visitor use described above.

Impacts in the Merced River Gorge and El Portal. Direct human intrusion into the majority of riparian areas of the Merced River gorge is minimal due to topography. The riparian zone would continue to be affected by facilities, roads, pullouts, contaminated stormwater runoff, non-native

species, use of non-motorized watercraft (and associated human trampling at launch and removal locations), and riprap. The riparian community through the Merced River gorge is listed as an example of an Outstandingly Remarkable Value and would continue to be affected by use of the El Portal Road (and associated pollutants), non-native species, and use of non-motorized watercraft. These potential effects would be considered long term and adverse.

The natural structure, diversity, and productivity of oak communities would continue to be affected by non-native species, fire suppression, and existing facilities. Continued concentrated visitor use and management policies would have site-specific, adverse effects on oak communities. In all other areas of the Merced River gorge, human-related effects to oak vegetation would continue.

Impacts in Wilderness Segments of the South Fork. Adverse effects to vegetation of the upper and lower South Fork are generally associated with facilities (existing and proposed) and visitor and stock use. No facilities, other than a few trails, currently occur in the upper and lower portions of the South Fork, access is difficult, and visitor and stock use is low. The only perceptible change anticipated under Alternative 1 could be an increase in the annual number of visitors to the park that may increase pressure on relatively unused portions of the South Fork. Although increased visitor use of the upper and lower reaches of the South Fork negatively affect vegetation by increasing erosion, soil compaction, trampling, and refuse, decreasing water quality and vegetative cover, and through the potential introduction of non-native species, these effects are considered speculative because topography and limited trail access would continue to limit the majority of visitors that can access these portions of the South Fork.

Impacts in Wawona. Under Alternative 1, vegetation within the central South Fork and Wawona would continue to be affected by existing facilities and visitor use. Size, structure, productivity, and continuity (within and between habitats) would continue to decrease due to conifer encroachment, human trampling, spread of non-native species, continued use of existing development, alteration of natural fire patterns (e.g., in the vicinity of structures), and loss of natural drainage patterns due to roads and diversions. Visitor use would continue to affect the vegetation of the central South Fork by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion, as described above. These effects would be long term and adverse.

The anticipated increase in overall visitors to the park also may increase pressure on relatively unused portions of the South Fork in the vicinity of Wawona, including Wawona Meadow, which is listed as an example of a biological resource Outstandingly Remarkable Value. Although Wawona Meadow is large and generally intact, it has been the site of repeated human intrusion since the turn of the century. The meadow continues to be affected by ditches, a golf course, a sprayfield for reclaimed water, and helicopter staging. These uses would remain and would continue to adversely affect Wawona Meadow.

Summary of Alternative 1 Impacts. Existing development and human activity in the Merced River corridor affect vegetation patterns. Implementation of Alternative 1 could result in the continued degradation of size, structure, productivity, and continuity of habitats by existing facilities and visitor use. Existing facilities could continue to alter natural habitat and ecosystem

patterns. Visitor use and the projected increase in park visitors would continue to cause adverse effects such as trampling, erosion, and compaction. The combined affects of visitor use and existing facilities can lead to alterations in vegetation patterns (e.g., type conversion of wet meadow to conifer forest) and modifications to the river channel and floodplain (e.g., channel widening). The National Park Service could continue to implement existing goals and policies (e.g., the 1916 *Organic Act*, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements to vegetation on an ad-hoc basis, as opportunities and resource problems are presented. For example, hampered by existing development and infrastructure, enhancement and re-establishment of woodlands could continue on a site-by-site basis rather than a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place under current direction, “reactive” resource management is not always effective at protecting sensitive resources over the long-term. Overall, effects could escalate as time passes and the effects on natural vegetative patterns worsened. These effects would be concentrated in areas of high visitor use such as Yosemite Valley, El Portal, Wawona, and in the vicinity of major trails. In areas of little use (e.g., a majority of the upper main stem of the Merced River, and the upper and lower portions of the South Fork), continued use of existing facilities (e.g., trails) at a similar level of intensity would have no perceptible effects on native vegetation.

Cumulative Impacts

Cumulative effects to vegetation discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local vegetation patterns (i.e., within the river corridor) as well as large-scale or regional vegetation patterns.

Past Actions. In general, vegetation patterns of the Sierra Nevada are relatively intact compared to other areas of California. Regional vegetation has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Portions of the Merced River and South Fork corridors within Yosemite National Park are relatively natural, especially in wilderness areas where use has had little effect on vegetation. Development and use of infrastructure within Yosemite Valley and throughout the Sierra Nevada have caused long-term, adverse alterations to native vegetation patterns since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects vegetation of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional vegetation include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native vegetation. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional vegetation include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect vegetation resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to vegetation resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on regional vegetation include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June

Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)

- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on vegetation resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native vegetation patterns. Regional population growth primarily affects regional vegetation patterns through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to vegetation, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, major, adverse effect on regional vegetation resources that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 1 could have a net long-term adverse effect on regional vegetation patterns.

Conclusions

Existing development and human activity in the Merced River corridor affect vegetation patterns. Implementation of Alternative 1 could result in the continued degradation of size, structure, productivity, and continuity of habitats by existing facilities and visitor use. Existing facilities could continue to alter natural habitat and ecosystem patterns. Visitor use and the projected increase in park visitors would continue to cause adverse effects such as trampling, erosion, and compaction. The combined affects of visitor use and existing facilities can lead to alterations in vegetation patterns (e.g., type conversion of wet meadow to conifer forest) and modifications to the river channel and floodplain (e.g., channel widening). The National Park Service could continue to implement existing goals and policies (e.g., the 1916 *Organic Act*, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements to vegetation on an ad-hoc basis, as opportunities and resource problems are presented. For example, hampered by existing development and infrastructure, enhancement and re-establishment of woodlands could continue on a site-by-site basis rather than a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place under current direction, “reactive” resource management is not always effective at protecting sensitive resources over the long-term. Overall, effects could escalate as time passes and the effects on natural vegetative patterns worsened. These effects would be concentrated in areas of high visitor use such as Yosemite Valley, El Portal, Wawona, and in the vicinity of major trails. In areas of little use (e.g., a majority of the upper main stem of the Merced River, and the upper and lower portions of the South Fork), continued use of existing facilities (e.g., trails) at a similar level of intensity would have no perceptible effects on native vegetation.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 1 could have a net long-term adverse effect on regional vegetation patterns.

Wildlife

Analysis

General Impacts. Impacts to wildlife in the park can generally be classified into three main categories (Knight and Cole 1991): (1) habitat modification and fragmentation by disturbing vegetation and soil and changing microclimates (e.g., picnic area and parking lot development, trampling habitat); (2) changing foraging or feeding ecology (e.g., discarding food or deliberately feeding animals); and (3) disturbance, whether intentional (harassment) or unintentional (e.g., wildlife observation, hiking across an animal’s territory).

The following discussion provides an overview of the types of impacts to wildlife resources that could occur within each segment of the Merced River corridor from application of management

elements (e.g., the VERP framework, management zoning, the River Protection Overlay, criteria and considerations).

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Meadows within the wilderness segments of the Merced River occur at Merced and Washburn Lakes, Echo Valley, at isolated locations along the Merced River, and at small alpine lakes. Wildlife habitat within the upper Merced River are generally intact. If campground and trail use continues at current levels, adverse impacts could occur at scarcer wet-meadow habitats and result in declines in associated species. For example, trampling of meadow habitat could reduce habitat for voles, reducing forage availability for great gray owls and California kingsnake.

Although administrative and concessioner stock (horses and mules) is typically contained in corrals and pastures away from the river, there would be an adverse impact on wildlife use of the corral areas (for example, cowbirds tend to occur in areas of heavy horse use). Likewise, the continued use of trails by horses and mules could increase cowbird parasitism, in addition to the effect of runoff from trails. Runoff can affect adjacent aquatic habitats by introducing unnaturally high levels of nutrients. Horse and mule droppings could, furthermore, lead to the introduction of non-native plant species and cause locally increased populations of insects such as flies.

Continued concentrated human use could have a site-specific, adverse effect on wildlife in the vicinity of the Merced Lake High Sierra Camp and Little Yosemite Valley Backpackers Campground through trampling of understory vegetation. Concentrated human use would have a mixture of adverse and beneficial effects. Concentrated use could perpetuate a long-term, adverse impact by locally reducing understory vegetation and downed wood (from firewood collection), causing direct disturbance of wildlife, and providing unnatural food sources. On the other hand, it could have a beneficial effect on the park's management of human/mountain lion encounters, which are more common when visitors disperse into little-used areas (Beier 1991). In all other areas of the upper Merced River, human-related effects to wildlife would continue except in site-specific locations where small concentrations of human use cause local, adverse impacts. The presence of food storage devices at Little Yosemite and Merced Lake Backpackers Campgrounds would have a long term, localized, beneficial effect by providing failproof food storage.

Coniferous forest habitats along the upper Merced River are structurally diverse and are expected to continue to support a full community of associated wildlife species, with the exception of site-specific, adverse impacts in popular, dispersed campsites or visitor use areas. Further downstream (into Little Yosemite Valley), in areas with less understory vegetation, continued concentrated human use along the north side of the Merced River would aggravate this affect over time and could have a site-specific, adverse effect on wildlife by degrading habitat within Little Yosemite Valley.

Impacts in Yosemite Valley. Heavily used areas in the Valley can approach the level of disturbance within an urban park. During reconnaissance surveys in 1998, for example, bird diversity at Yosemite Falls was characterized by a preponderance of disturbance-tolerant species. Earlier researchers at the park (Foin et al. 1977, cited in Knight and Gutzwiller 1995) found that Brewer's blackbirds and mountain chickadee increased in areas near visitor trails, while other species decreased (e.g., dark-eyed junco).

As discussed in the previous section, meadow habitat acreage in the Valley has substantially diminished from levels present during pre-Euro-American times and has impacted dependent wildlife species such as Pacific tree frog or red-winged blackbird. The park has already instituted meadow restoration programs that illustrate how productive these habitats can be.

Overall, continued use of facilities at a similar level of intensity could have an adverse effect on wildlife use of the riparian corridor in Yosemite Valley. Wildlife and habitats are already greatly affected by the overall amount of noise, traffic, and human presence, and the effect would continue for riparian-dependent species (e.g., belted kingfisher) at facilities such as North and Lower Pines Campgrounds and Camp 6.

Aquatic habitats have long been subject to modification through the removal of woody debris from the stream channel, a practice that affected natural stream dynamics, reduced habitat diversity for aquatic organisms, and affected nutrient cycling in these habitats.

In forested habitats, encroachment of conifers into California black oak woodlands has probably altered species composition, abundance, and diversity. This situation could continue under Alternative 1 due to the inability to manage trees within and surrounding developed areas with prescribed fire. The encroachment of conifers into California black oak woodlands has affected the availability of acorns as an important seasonal food source for species such as black bears, mule deer, acorn woodpeckers, gray squirrels, and numerous small rodents. Furthermore, conifers provide less suitable habitat for species such as great-horned owls, yellow-rumped warbler, and western bluebird. The impact would be long term and adverse (an ultimate loss of diversity), and, could affect one of Yosemite Valley's Outstandingly Remarkable Values (large stands of black oak).

Impacts in the Merced River Gorge and El Portal. Montane hardwood conifer becomes the dominant type adjacent to riparian areas below Yosemite Valley. This type is broadly transitional between upper-elevation forest types to chaparral and is thus the most important type for migratory wildlife and their associated predators. Access among habitats by wildlife is affected on the north side of the river by roads, residences, lodging, and other human activities and development. In contrast, habitats on the south side of the river are relatively pristine and free of human-made barriers. The quality of these north-facing habitats is recognized as an Outstandingly Remarkable Value in the El Portal area.

Impacts in the Wilderness Segments of the South Fork. Habitats upstream and downstream of Wawona along the South Fork are relatively inaccessible and intact. Implementation of Alternative 1 would not substantially alter the form or function of these communities.

Impacts in Wawona. Habitats along the South Fork—meadow, riparian, scrub and chaparral, and coniferous and deciduous forests—comprise nearly a full range of wildlife habitats, and the fishery² along South Fork is designated a biological resource Outstandingly Remarkable Value

² The 1996 Outstandingly Remarkable Values erroneously designated the fishery along the South Fork as “pristine.” Introductions of fishes into the Merced River drainage probably began with transfers of Lahontan cutthroat trout, coastal rainbow trout, and California golden trout from nearby waters. Rainbow trout is the only species native to the Merced River; rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or have displaced, the original strain. Other species of trout not native to California, including brook trout, brown trout, and arctic grayling, have also been introduced into the Merced River drainage. The South Fork supports self-sustaining populations of introduced brook, rainbow, and brown trout.

under current direction, as are the meadow and wetland communities in Wawona. A survey in 1998 again found willow flycatcher in this location, but breeding has not yet been confirmed. The species is indicative of an intact meadow-riparian complex.

For the coniferous and deciduous forests adjacent to Wawona, the principal impact is fragmentation due to existing development and use. With the foreseeable increase in visitors, this alternative could result in a long-term, adverse impact to wildlife (Andrén 1994).

The South Fork supports self-sustaining populations of brook, rainbow, and brown trout. Through Wawona, the South Fork also supports introduced Sacramento pikeminnow, Sacramento sucker, and hardhead. There is less pressure by anglers on the South Fork fisheries than on the main stem due to difficulty of access and terrain. There could be adverse impacts under Alternative 1, owing to deferred opportunities for restoration and protection.

Summary of Alternative 1 Impacts. Past wildlife management practices, development, and human activity in the Merced River corridor have adversely affected wildlife habitats and patterns. Under Alternative 1 four basic adverse impacts would continue to occur and are expected to worsen over time. These include degradation in habitat quality for riparian and wet-meadow-dependent wildlife; loss of habitat connectivity and increase in habitat fragmentation; an increase in human-related disturbance, and continued stress on wildlife through factors such as the increasing presence of non-native species and disturbance-tolerant wildlife. The National Park Service would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements on an ad-hoc basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and re-establishment of woodlands would continue on a site-by-site basis rather than on a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place under current direction, “reactive” resource management is not always effective at protecting sensitive resources over the long term. Overall, effects could escalate as time passed and the effects on natural wildlife patterns could become worse. These effects would be concentrated in areas of high human use such as Yosemite Valley, El Portal, and Wawona, where the loss of species diversity and habitat has already occurred.

Cumulative Impacts

Cumulative effects to wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wildlife patterns (i.e., within the river corridor) as well as large-scale or regional wildlife patterns.

Past Actions. Wildlife communities have been manipulated almost since the beginning of the park. Regional wildlife has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Fur-bearing mammals were trapped by park rangers until 1925; lions were considered dangerous predators and controlled through the 1920s; bears were artificially fed as a tourist attraction until 1940. Natural wildfires, with their generally beneficial effects on wildlife habitat,

were routinely suppressed until 1972 (Wuerthner 1994). Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

Yosemite's largest mammal, the grizzly bear, was extirpated from the region and from the state in the 1920s. Other mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by human activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including Yosemite National Park. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes.

Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Most fish currently found in the Merced River and its tributaries in Yosemite National Park have been introduced. Prior to trout stocking for sport fishing, native fish in Yosemite were probably limited to the rainbow trout and the Sacramento sucker, both of which were present only in the lower portions of the Merced River (i.e., Yosemite Valley and below). Rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or has displaced, the original strain.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wildlife of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic,

biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wildlife include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wildlife. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wildlife include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco),
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)

- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wildlife resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to wildlife resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) wildlife, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on regional wildlife include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)

- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native wildlife patterns. Regional population growth primarily affects regional wildlife patterns through construction (e.g., new housing and infrastructure) and human use. Examples of construction- and human-use-related effects on wildlife patterns include direct displacement of wildlife (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). More importantly, some of the projects provide for increased residential growth adjacent to the park and would accommodate increased recreational development. In total, regional development and growth could have a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. For the species at higher elevations, the effects are somewhat mitigated by resource protection planning and restoration. Although each new development is required to mitigate or compensate for adverse effects to wildlife, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate, adverse effect on regional wildlife resources that would not be compensated by regional planning and restoration projects discussed above.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be adverse, and long term.

Conclusions

Past wildlife management practices, development, and human activity in the Merced River corridor have adversely affected wildlife habitats and patterns. Under Alternative 1 four basic adverse impacts would continue to occur and are expected to worsen over time. These include degradation in habitat quality for riparian and wet-meadow-dependent wildlife; loss of habitat connectivity and increase in habitat fragmentation; an increase in human-related disturbance, and continued stress on wildlife through factors such as the increasing presence of non-native species

and disturbance-tolerant wildlife. The National Park Service would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Natural Resources Management Plan*, *Vegetation Management Plan*) and make incremental improvements on an ad-hoc basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and re-establishment of woodlands would continue on a site-by-site basis rather than on a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place under current direction, “reactive” resource management is not always effective at protecting sensitive resources over the long term. Overall, effects could escalate as time passed and the effects on natural wildlife patterns could become worse. These effects would be concentrated in areas of high human use such as Yosemite Valley, El Portal, and Wawona, where the loss of species diversity and habitat has already occurred.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be adverse and long term.

Rare, Threatened, and Endangered Species

Analysis

General Impacts. Due to the programmatic and prescriptive nature of the project, it is difficult to predict impacts on individual species with any accuracy. No attempt is made to quantify discrete impacts to individual species and the conclusions herein are limited to general statements about rare, threatened, or endangered (sometimes referred to as “special-status”) plants and animals considered as a whole. A more detailed biological assessment was presented to the U.S. Fish and Wildlife Service in compliance with Section 7 of the Federal Endangered Species Act in January 2000. A revised Biological Assessment, based on this *Merced River Plan/FEIS* will be submitted to the U.S. Fish and Wildlife Service in June 2000.

All other aspects of the analysis being equal, species present in low numbers or of limited distribution are the most sensitive to impacts. Simultaneously, species of lesser rarity but greater vulnerability to the types of actions that might take place (as a result of management decisions under the plan) are also important as measures of adverse impact to park ecosystems. Species that are members of both groups are considered to be vulnerable at a programmatic level (i.e., as a result of even broad management decisions implicit in the *Merced River Plan*) and are discussed below as examples of possible effects.

River-related rare, threatened, and endangered species are considered a general biologic resource Outstandingly Remarkable Value. Therefore, any adverse or beneficial effect described herein to

river-related rare, threatened, or endangered species is considered to have a corresponding effect on the general Outstandingly Remarkable Value.

The following discussion provides an overview of the types of impacts to rare, threatened, and endangered species that could occur within each segment of the Merced River corridor from application of Alternative 1.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Habitats of the wilderness reaches of the Merced River are generally intact, except where visitor use is intense (e.g., in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes). Under Alternative 1, use of these facilities could continue consistent with existing conditions. Habitats at these locations could continue to be negatively affected by development and visitor and stock use. Existing development could adversely affect rare, threatened, and endangered species and their habitats, primarily through habitat fragmentation and the imposition of unnatural barriers to plant and wildlife movements (barriers in turn affect seed sources, nutrients, and plant distribution patterns). It is anticipated that annual day use of easily accessible wilderness areas (e.g., the trail to Half Dome) could increase with the projected increase in visitor demand. Types of adverse effects associated with continued visitor and stock use include site-specific degradation of water quality (e.g., refuse, fecal coliform bacteria, and other human- and stock-associated pollutants), potential introduction or spread of noxious weeds (primarily by stock), and grazing, trampling, compaction and erosion, resulting in loss of natural structure, diversity, and productivity.

The degree to which rare, threatened, and endangered species would be affected depends on individual species requirements habitat requirements, position relative to facilities and use, and sensitivity to perturbation. Rare, threatened, and endangered species that occur in close proximity to Merced Lake High Sierra Camp and Backpackers Campground, Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, and major trail routes could experience adverse effects.

The following examples describe general actions and related adverse effects that could occur in the vicinity of facilities and areas of concentrated use. These effects are generally considered long-term and adverse. In all other areas of the wilderness reaches of the main stem of the Merced River, continued use of existing facilities (e.g., trails) at a similar level of intensity would have no effects on rare, threatened, and endangered species.

- Trampling, grazing, or camping within meadows could have direct effects on rare plants such as the Mono Hot Springs evening primrose and habitat for ground dwelling special-status wildlife including Sierra Nevada mountain beaver.
- Trampling and grazing of meadows could reduce habitat for voles, therefore reducing the prey base for great gray owls.
- Stock use would continue to support the local abundance of brown-headed cowbirds (a nest parasite) to the detriment of species such as willow flycatcher and yellow warblers.
- Continued rock climbing could adversely affect crevice-roosting special-status species of bats, such as greater western mastiff bat.

- Continued concentrated visitor use along the north side of the Merced River within Little Yosemite Valley could have site-specific, adverse effects on forest communities located north of the river and may have long-term, adverse effects on habitat for northern goshawk and Cooper’s hawk at this location, as repeated disturbances near nest trees can result in nest failure or abandonment.

Impacts in Yosemite Valley. Under Alternative 1, size, structure, productivity, and continuity (within habitat and between habitats) of habitats within Yosemite Valley could continue to be affected by existing facilities, stock, and visitor use.

Existing facilities, such as roads, bridges, ditches, and campgrounds, could continue to affect habitats (e.g., drain wet meadows), fragment, and have adverse effects on rare, threatened, and endangered species by imposing unnatural barriers to plant and wildlife movements. Fire management near developed areas would not change under Alternative 1 and could promote mistletoe and oak galls and continued conifer encroachment into adjacent communities (e.g., oak woodlands, wet meadows, and riparian woodlands). Lack of fire has generally resulted in dense overgrown understory and a shift in species composition to more shade-tolerant coniferous species such as white fir, Douglas-fir, and incense-cedar. Roads, parking lots, and other impervious surfaces in or near the corridor could continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to low-lying wetlands and the aquatic habitat of the Merced River.

Within Yosemite Valley, the effects of stock are concentrated at stables and along major trails. General human-related effects include trampling, litter, noise, night lighting, erosion, compaction, and unintentional introduction and spread of non-native plants and wildlife. It is anticipated that overall visitor demand and use of the park would increase. Visitor use could continue to affect habitat for rare, threatened, and endangered species by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Modifications to the river channel and floodplain (through soil compaction, loss of riparian vegetation, and accelerated erosion) influence important stream characteristics that may combine to accelerate widening of the Merced River and alter overall vegetative patterns in Yosemite Valley. Trampling and visitor use could continue to adversely affect understory vegetation, introduce and spread non-native species, and impede natural regeneration of native oaks, woody shrubs, and riparian and meadow vegetation.

The following examples describe general actions and related adverse effects that could occur to rare, threatened, and endangered species within Yosemite Valley:

- Trampling of meadows (e.g., at the base of El Capitan) could have direct effects on rare plants, such as habitat for ground-dwelling wildlife species (e.g., voles), therefore reducing the prey base for great gray owl.
- Continued high visitor use and continuation of the stables within Yosemite Valley would promote brown-headed cowbirds to the detriment of species such as yellow warbler.
- Riparian-dependent species (e.g., belted kingfisher) would continue to be adversely affected by overall amount of noise, traffic, and human presence at facilities such as North and Lower Pines Campgrounds and Camp 6.
- Continued expansion of coniferous forests throughout Yosemite Valley could adversely affect wildlife species such as great-horned owl, yellow-rumped warbler, and western

bluebird and plant species including sugar stick, boreal bedstraw, false pimpernel, azure penstemon, and ladies' tresses that depend more heavily on meadow and oak woodland habitats.

- Non-native planted trout could continue to affect native rainbow trout strains. Bullfrogs could continue to affect special-status amphibians, or possible reintroduction efforts (e.g., for California red-legged frog).
- Continued non-native predation, fragmentation of aquatic and floodplain habitats, use of non-motorized watercraft, swimming, and fishing may adversely affect northwestern pond turtle.
- Increased human presence and human-related effects associated with the use of facilities (e.g., night lighting, reduction of habitat, noise, erosion) would likely result in long-term, adverse effects to hawks (e.g., Cooper's hawk, sharp-shinned hawk) within Yosemite Valley.
- Implementation of this alternative could negatively affect the success of reintroduction or recolonization of species, such as harlequin duck and willow flycatcher, now extirpated from Yosemite Valley.

The National Park Service could continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements on an ad-hoc basis as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and re-establishment of oak woodlands would continue on a site-by-site rather than a Valleywide basis. Although substantial improvements can take place under current direction and implementation, "reactive" resource management is not always effective at protecting sensitive resources over the long term.

In general, the ongoing effect of habitat degradation combined with continued visitor use and the foreseeable increase in visitors could make the current situation worse and result in long-term adverse effects to rare, threatened, and endangered species within Yosemite Valley. For example, potential effects to Cooper's hawk would likely be adverse, given the abundance of suitable habitat away from the river while continued effects to already rare or absent species such as California red-legged frog and great gray owl, would be considered long-term and adverse.

Impacts in the Merced River Gorge and El Portal. Direct human intrusion into the majority of riparian and other habitat areas of the Merced River gorge is minimal due to topography. The riparian zone could continue to be affected by facilities, roads, turnouts, contaminated stormwater runoff, non-native species, use of non-motorized watercraft (and associated visitor trampling at launch and removal locations), and riprap. Roads, parking lots, and other impervious surfaces in or near the corridor could continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to the aquatic habitat of the Merced River. The natural structure, diversity, and productivity of oak communities could continue to be affected by non-native species, fire suppression, and existing facilities. Continued concentrated visitor use and management policies could have site-specific, adverse effects on oak communities. In all other areas of the Merced River gorge, human-related effects to oak habitats would continue.

The following examples describe general actions and related adverse effects that could occur to rare, threatened, and endangered species within the Merced River gorge.

- Use of the El Portal Road (and associated pollutants), presence of non-native species, and trampling (e.g., at launch and removal sites for non-motorized watercraft) could have adverse effects on special-status species such as Tompkin's sedge or Valley elderberry longhorn beetle.
- Noise and lighting associated with vehicle traffic and developed areas, and fire suppression in close proximity to structures could adversely affect habitat for spotted owl over the long term.

In general, the ongoing effect of habitat degradation combined with continued visitor use and the foreseeable increase in visitors could result in a long-term (depending on specific effects on particular species), adverse effects to rare, threatened, and endangered species within the Merced River gorge.

Impacts in Wilderness Segments of the South Fork. No facilities (other than a few trails) currently occur in the upper and lower portions of the South Fork (above and below Wawona), access is difficult, and visitor and stock use is low. Rare, threatened, and endangered species of plants and wildlife reported in the South Fork generally occur in wilderness portions of the corridor or relatively inaccessible habitats. The only perceptible change anticipated under Alternative 1 could be an overall increase in visitors to the park that may increase pressure on relatively unused portions of the South Fork. Although increased visitor use of the upper and lower reaches of the South Fork could negatively affect habitats, these effects are considered speculative because topography would continue to limit the majority of visitors that can access these portions of the South Fork.

Impacts in Wawona. Under Alternative 1, habitats within the Wawona could continue to be affected by existing facilities and visitor use. Size, structure, productivity, and continuity (within habitat and between habitats) could continue to decrease due to conifer encroachment, visitor trampling, spread of non-native species, continued use of existing development, alteration of natural fire patterns (e.g., in the vicinity of historic structures), and loss of natural drainage patterns due to roads and diversions. Visitor use could continue to affect habitats of the central South Fork by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion, as described above. Roads, parking lots, and other impervious surfaces in or near the corridor could continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to low-lying wetlands and the aquatic habitat of the South Fork.

The following examples describe general actions and related adverse effects that could occur to rare, threatened, and endangered species along the South Fork. These effects are generally considered long term and adverse.

- Continued degradation of meadow and aquatic habitats coupled with an expected increase in visitors, could adversely affect species such as Wawona riffle beetle and willow flycatcher.

The South Fork includes nearly a full range of environments typical to the Sierra Nevada and supports numerous populations of rare plants and wildlife. Alternative 1 would likely have no effect on populations or individuals of these species.

Summary of Alternative 1 Impacts. Development and visitor activity in the Merced River corridor has affected rare, threatened, and endangered species. Implementation of Alternative 1 could continue to alter natural habitat and ecosystem patterns. The National Park Service would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements on an ad-hoc basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and re-establishment of woodlands could continue on a site-by-site basis rather than on a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place given consistent under current direction, “reactive” resource management is not always effective at protecting of sensitive resources over the long term. Overall, effects to rare, threatened, and endangered species would be considered long-term and adverse. Effects could escalate as time passes and natural ecosystem patterns are not restored. These effects would be concentrated in areas of heavy visitor use such as Yosemite Valley. In areas of little use (e.g., a majority of the upper main stem of the Merced River and the upper and lower portions of the South Fork), continued use of existing facilities (e.g., trails) at a similar level of intensity would have little effect on rare, threatened, and endangered species.

Cumulative Impacts

Cumulative effects to rare, threatened, and endangered species discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region. The intensity of impact depends on whether the impacts are anticipated to interact cumulatively. For example, factors external to the park, such as broad regional habitat degradation and pesticide use, can combine with existing, in-park impacts, such as non-native species, to cause declines in rare, threatened, or endangered amphibians (e.g., mountain yellow-legged frog and Yosemite toad), an adverse, cumulative impact. The projects identified below include those projects that have the potential to effect populations of rare, threatened, or endangered species (i.e., within the river corridor) as well as large-scale or regional populations of the same species.

Past Actions. Natural habitats have been manipulated almost since the beginning of the park. Regional wildlife and vegetation patterns have been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by visitor activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley, probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native

fish, pesticides, and diseases. Past and ongoing activities that affect rare, threatened, or endangered species include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects habitats immediately adjacent to the roadway. Special-status species with potential to be affected during construction include Valley elderberry longhorn beetle, roosting bats, peregrine falcon, and Tompkin's sedge. Special-status roosting bats could be affected, primarily through the noise generated by construction equipment and blasting. Blasting is also a concern for the peregrine falcon, known to occur at the Cascades aerie in the project vicinity (the peregrine was recently delisted but continues to be a species of concern in the park). Adverse effects to these species are avoided or minimized during construction by implementation of a compliance monitoring program, pre-construction surveys, erosion and sediment controls, minimizing noise during sensitive biological periods, construction timing restrictions, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional rare, threatened, or endangered species include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness

- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional rare, threatened, or endangered species. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional rare, threatened, and endangered species include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect rare, threatened, and endangered species during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to rare, threatened, and endangered species by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g.,

potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on regional rare, threatened, and endangered species include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on rare, threatened, and endangered species during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including rare, threatened, and endangered species. Regional population growth primarily affects regional rare, threatened, and endangered species through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on rare, threatened, and endangered species include direct displacement of rare, threatened, and endangered species (e.g., nest trees removed and replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., the spread of yellow star thistle by construction equipment and its subsequent adverse impacts on special status plant species), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development

is required to mitigate or compensate for adverse effects to rare, threatened, and endangered species, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate to major (depending on species-specific impacts), adverse effect on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have long-term, moderate to major (depending on species-specific impacts), adverse cumulative impacts on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above. These cumulative actions in combination with Alternative 1 could have a net long-term, adverse effect on regional rare, threatened, and endangered species.

Conclusions

Development and visitor activity in the Merced River corridor has affected rare, threatened, and endangered species. Implementation of Alternative 1 could continue to alter natural habitat and ecosystem patterns. The National Park Service would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*) and make incremental improvements on an ad-hoc basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and re-establishment of woodlands could continue on a site-by-site basis rather than on a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place given consistent under current direction, “reactive” resource management is not always effective at protecting of sensitive resources over the long term. Overall, effects to rare, threatened, and endangered species would be considered long-term and adverse. Effects could escalate as time passes and natural ecosystem patterns are not restored. These effects would be concentrated in areas of heavy visitor use such as Yosemite Valley. In areas of little use (e.g., a majority of the upper main stem of the Merced River and the upper and lower portions of the South Fork), continued use of existing facilities (e.g., trails) at a similar level of intensity would have little effect on rare, threatened, and endangered species.

Although cumulative actions could have a long-term, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have long-term, moderate to major (depending on species-specific impacts), adverse cumulative impacts on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above. These cumulative actions in combination with Alternative 1 could have a long-term, adverse effect on regional rare, threatened, and endangered species.

Air Quality

Analysis

General Impacts. Under Alternative 1, air quality would continue to be listed as an Outstandingly Remarkable Value along all segments of the main stem and South Fork of the Merced River in the park, but not the El Portal Administrative Site; however, no policies that protect or enhance air quality along these segments have been developed as a direct result of such listing. Policies and actions that protect and enhance air quality in the corridor arise not from the Wild and Scenic Rivers Act but from such laws as the federal Clean Air Act.

Under this alternative, air quality in the corridor would continue to be influenced by local pollution sources within the park and by regional sources upwind of the park. Local emissions sources include stationary, area, and mobile sources. Generally, the effects of local emissions sources would be limited to those areas, such as the Valley, the El Portal Administrative Site, and Wawona, where the sources are concentrated; portions of the corridor that extend through wilderness areas would continue to be largely free of effects from local emissions sources (with the exception of prescribed fires), but would be subject to regionwide emissions trends.

Emissions from local stationary sources, such as fossil-fuel-powered mechanical equipment, would continue to be regulated through applicable Mariposa County Air Pollution Control District *Rules and Regulations*.

Local area pollution sources would continue to include regular maintenance activities, campfires, woodstoves, fireplaces, prescribed fires, and vehicle entrainment of road dust. Some of these sources would continue in the same manner and extent as under existing conditions, while others would increase in relative proportion to visitor use levels.

Regular maintenance-related activities would result in temporary increases in emissions of particulate matter in the immediate vicinity of such activities. Campfires, woodstoves, and fireplaces would continue to be subject to park regulations, and related emissions would not be expected to increase, because the number of campsites and housing (where campfires, woodstoves, and fireplaces are used) would remain much the same under this alternative as under existing conditions and because campsites and housing are already full most of the year. Campfire-, woodstove-, and fireplace-related emissions would continue to affect air quality and visibility within the Valley and near Wawona under certain meteorological conditions. Emissions from prescribed burning would continue to be controlled through implementation of smoke management policies in the 1990 *Fire Management Plan*; these policies are intended to minimize impacts on air quality from prescribed burning within the park and region. Emissions from vehicle entrainment of road dust would continue to affect air quality, particularly in winter and early spring, when drying road surfaces expose sand deposited for traction to vehicle entrainment into the atmosphere. Road dust would increase in rough proportion to the number of vehicle-miles-traveled within the park.

Local mobile sources would continue to include automobiles, trucks, and buses and would remain subject to state and federal emissions control standards and programs, which are expected to lead to a continuing decrease in emissions per vehicle-mile-traveled for the foreseeable future. In the

future, the number of vehicles in the Valley on typically busy days would be essentially the same as under existing conditions since, on those days, the Restricted Access Plan would be in effect; however, the number of days during which the plan would be in effect would increase, and, on an average basis, the number of vehicles would increase in rough proportion to the number of annual visitors. As a general matter, the downward trend in emissions of ozone precursors per vehicle would more than offset the incremental increase in the number of annual vehicle trips within the Valley. Based on composite vehicle emissions factors derived from data published by the state Air Resources Board, the anticipated reduction in emissions per vehicle-mile would be approximately 80% for volatile organic compounds and 50% for nitrogen oxides between existing conditions and 2020. Volatile organic compounds and nitrogen oxides are precursor compounds associated with ozone formation. However, in contrast to the ozone precursors, most of the particulate matter associated with vehicle use is related to entrainment of road dust rather than to exhaust. Thus, as explained above, particulate emissions would be expected to increase in the future in rough proportion to the number of vehicle-miles-traveled within the Valley.

Summary of Alternative 1 Impacts. Under this alternative, air quality in the corridor would continue to be influenced by local pollution sources within the park and by regional sources upwind of the park. The relative importance of local and regional sources would continue to vary by season and by pollutant. Furthermore, non-wilderness portions of the corridor would be affected by local emissions sources to a much greater extent than wilderness portions. Local stationary sources would continue to be regulated under Mariposa County *Rules and Regulations*; some local area sources would continue to be subject to park regulations; and mobile sources would continue to be subject to state and federal tailpipe emissions standards. With respect to ozone precursors, overall local emissions under Alternative 1 would follow the regional downward trend relative to existing conditions, which would represent a long-term, regional, beneficial effect. With respect to particulate matter, overall local emissions under Alternative 1 could increase relative to existing conditions, resulting in a long-term, adverse effect, since that pollutant is more closely linked to overall vehicle-miles-traveled, which would increase, than to tailpipe exhaust emissions, which would decrease.

Cumulative Impacts

Cumulative effects to air quality discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect air quality within the river corridor or that could be affected by air pollutant sources within the river corridor.

Past Actions. Since 1950, the population of California has tripled, and the rate of increase in vehicle-miles-traveled has increased six-fold. Air quality conditions within the park have been influenced by this surge in population growth and its associated emissions from related industrial, commercial, and vehicular sources in upwind areas as tempered by a burgeoning regulatory apparatus. Since the 1970s, emissions sources operating within the park, as well as California as a whole, have been subject to local stationary-source controls and state and federal mobile-source controls. With the passage of time, such controls have been applied to an increasing number of sources, and the associated requirements have become dramatically more stringent and complex.

In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles and their related emissions until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The 1990 *Fire Management Plan* was developed to address management issues related to prescribed natural burns, prescribed burns, and wildfires in the park. Implementation of the smoke management policies of the 1990 *Fire Management Plan* reduces the potential for burns or wildfires to have a major effect on air quality in the park or in the park vicinity.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both negative (short-term during construction) and potentially beneficial (long-term) effects on air quality. Short-term, construction-related effects include dust and other pollutant emissions associated with operation of construction equipment, earthmoving activities, and vehicle travel over unpaved surfaces. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which could have a long-term, beneficial impact by reducing automobile trips.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects not anticipated to have a net adverse or beneficial, long-term effect.

Examples of projects that could have a cumulative, beneficial, long-term effect on air quality include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park.
- The San Joaquin Corridor Rail Projects (DOT, Amtrak) would contribute to a long-term, beneficial impact on air quality because such improvements would encourage travel by alternative (non-private vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resources Management Building (NPS) are two projects that would reduce work/home commutes for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Reconstruction Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term, major, adverse impacts on local air quality

primarily due to dust from construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle emissions.

- Several other regional projects that will have a net beneficial effect on air quality by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS) and the Expansion of Mariposa County Transit System.

Although most of the aforementioned projects would have localized, short-term adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would have a beneficial, long-term effect on air quality.

Reasonably foreseeable future actions that could have an adverse effect on air quality include:

- Revisions to the 1990 *Yosemite Fire Management Action Plan* and development of the U.S. Forest Service's *Fire Management Action Plan for Wilderness*, which could lead to increased use of prescribed burning techniques
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects the A-Rock Reforestation, the Fire Management Action Plan for Wilderness (USFS, Stanislaus), and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The Wawona Campground Improvement (NPS)
- Various development-related projects such as the Mariposa County General Plan Update; Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); and the Buildout of City of Merced, General Plan
- The Highway 41 Extension (Madera Co.), which would not be a land use development project but would remove an obstacle to land use development (and associated emissions) in the fast-growing area north of Fresno

Revisions to 1990 *Yosemite Fire Management Plan*, the development of the *Fire Management Action Plan for Wilderness* (USFS, Stanislaus), and the fuels and reforestation projects could lead to increased use of prescribed burning techniques and could have an intermittent, long-term, adverse effect on local and regional air quality and visibility, depending upon the extent to which these projects protect air resources. The Wawona Campground Improvement (NPS) would construct additional campsites, which could result in increased local emissions from campfires, unless the overall project (which would also involve rehabilitation of an existing campground) provides for group fire rings, rather than fire rings at each campsite.

Cumulative growth in the region, and the transportation projects such as the Highway 41 Extension (Madera Co.) that support cumulative growth, would have localized, short-term, construction-related impacts; over the long term, these projects would generate emissions of ozone precursors and particulate matter primarily due to associated motor vehicle trips.

Reasonably foreseeable future actions not anticipated to have a net adverse or beneficial effect on air quality, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); and South Fork Merced River Bridges Replacement (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration Project (NPS); update to the Yosemite Wilderness Management Plan (NPS); Tamarack Campground Rehabilitation (NPS); Bridalveil Horse Camp Rehabilitation (NPS); Yosemite Creek Campground Rehabilitation (NPS); and the South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM)
- Land exchanges, such as Yosemite View Parcel Land Exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on air quality due to construction activities, and, in some cases, these effects would occur within the corridor. With respect to long-term effects, a distinction can be made between ozone and particulate matter. For ozone, regional emissions trends suggest that the combination of the beneficial effect of ongoing regional, state, and federal regulatory controls (particularly mobile-source control programs) with the adverse effect of existing and future land use development and associated stationary, area, and mobile emissions sources, would result in a regional, moderate, beneficial effect. That is, the beneficial effect of past and present actions that regulate stationary and mobile emissions sources and reasonably foreseeable future actions that have the potential to reduce vehicle trips and vehicle-miles-traveled would offset the adverse effect of ozone precursor emissions associated with increased cumulative growth in the region, leading to a gradual improvement in ozone air quality.

For particulate matter, the net cumulative effect is more difficult to determine, since ambient concentrations of particulate matter reflect primary (i.e., directly emitted) particles as well as secondary (i.e., derived through photochemical reactions involving precursor pollutants) particles derived from emissions of volatile organic compounds, nitrogen oxides, and sulfur oxides. One of the principal sources of directly emitted particles is entrainment of dust by vehicles moving over paved roads, and this component of particulate matter would increase in proportion to increases in vehicle-miles-traveled associated with cumulative growth. One of the secondary sources of particulate matter, sulfur oxides, would also continue to increase with cumulative growth. In contrast, as discussed above in connection with ozone, emissions of volatile organic compounds and nitrogen oxides would continue a downward trend despite cumulative growth, and thus, their contribution to particulate matter concentrations would diminish. Furthermore, unlike ozone, which is considered a regional pollutant, particulate matter reflects both local and regional sources, and the relative influence of these two basic types of sources changes from day to day. Thus, given the opposing emissions trends and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the cumulative effect relative to particulate matter would be beneficial or adverse; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Since Alternative 1 would not involve any substantial construction projects, the local, short-term, adverse cumulative effects on air quality due to construction activities that are cited above would be due to the cumulative projects. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 1; as discussed above, the long-term, regional effect would be beneficial, primarily due to the emissions reductions expected to occur with implementation of on going state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources and the relative influence of these two types of sources would vary from day to day and season to season. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 1 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Conclusions

Under this alternative, air quality in the corridor would continue to be influenced by local pollution sources within the park and by regional sources upwind of the park. The relative importance of local and regional sources would continue to vary by season and by pollutant. Furthermore, non-wilderness portions of the corridor would be affected by local emissions sources to a much greater extent than wilderness portions. Local stationary sources would continue to be regulated under Mariposa County *Rules and Regulations*; some local area sources would continue to be subject to park regulations; and mobile sources would continue to be subject to state and federal tailpipe emissions standards. With respect to ozone precursors, overall local emissions under Alternative 1 would follow the regional downward trend relative to existing conditions, which would represent a long-term, regional, beneficial effect. With respect to particulate matter, overall local emissions under Alternative 1 could increase relative to existing conditions, resulting in a long-term, adverse effect, since that pollutant is more closely linked to overall vehicle-miles-traveled, which would increase, than to tailpipe exhaust emissions, which would decrease.

Since Alternative 1 would not involve any substantial construction projects, the local, short-term, adverse cumulative effects on air quality due to construction activities that are cited above would be due to the cumulative projects. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 1; as discussed above, the long-term, regional effect would be beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary on a daily and seasonal basis. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 1 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Noise

Analysis

General Impacts. Under this alternative, “natural quiet” would continue to be listed as an Outstandingly Remarkable Value along the wilderness segment of the main stem of the Merced River, and the wilderness and “below Wawona” segments of the South Fork. However, no policies that protect and enhance natural quiet along these segments have been developed as a direct result of such listing. Policies and actions that protect and enhance natural quiet in the corridor arise not from the Wild and Scenic Rivers Act but from such plans as the 1989 *Wilderness Management Plan*.

Under Alternative 1, the acoustical environment in wilderness areas would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. In some wilderness areas, such overflights would continue to be the principal source of adverse noise impacts. The permit system under the *Wilderness Management Plan* would continue to minimize the noise associated with visitor use in wilderness by restricting the number of overnight visitors. In contrast, noise from high-altitude aircraft overflights, which is an issue that is national in scope, will likely worsen over the long term, given the upward national trend in the number of aircraft flights.

The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Local conflicts between noise-sensitive uses and vehicular noise would continue to occur over the long term and would increase in severity due to the expected cumulative increase in visitation levels and related vehicular activity. The gradual increase in visitation and related vehicular traffic would lead to an incremental increase in roadside noise levels. On typically busy days, when the Restricted Access Plan would be in effect, roadside noise levels would be essentially the same as under existing conditions, since the same relative number of visitors would be allowed to travel to the Valley. In both wilderness and non-wilderness areas, maintenance activities (e.g., helicopter use in support of park operations) would continue under this alternative, and such activities would result in local, short-term, adverse, noise impacts, but it would be speculative to conclude that such activities would increase or decrease in frequency or duration.

Summary of Alternative 1 Impacts. The acoustical environment in wilderness areas would not be affected by Alternative 1, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Alternative 1 would accommodate a gradual increase in annual visitation, which would lead to a local, long-term, adverse effect along the various roads that traverse the corridor in non-wilderness areas.

Cumulative Impacts

Cumulative effects to the ambient noise environment discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect noise within the river corridor or could be affected by noise sources within the corridor.

Past Actions. Development of facilities that include various sources of noise has occurred in and near some segments of the river corridor. Such facilities include roadways, campgrounds, lodging, and administrative buildings. Generally, these facilities were developed with limited consideration of potential noise impacts. From a regulatory standpoint, relevant state and federal noise standards typically apply to individual types of noise sources, such as automobiles and buses, rather than to overall noise levels, but National Park Service has adopted two plans, a Restricted Access Plan and the *Wilderness Management Plan*, that indirectly affect overall noise levels in the river corridor. The Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the indirect effect of limiting the amount of vehicle noise during peak periods by restricting the number of incoming vehicles until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The *Wilderness Management Plan* was developed to preserve a wilderness environment in which the natural world along with the processes and events that shape it are largely untouched by human interference. Implementation of the permit system for overnight camping under the *Wilderness Management Plan* reduces potential noise impacts in those areas where natural quiet is an important element of the visitor experience.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on noise. Short-term, construction-related effects include noise from heavy equipment operations. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which may have a long-term, beneficial impact on roadside noise levels by replacing automobile trips with a fewer number of transit vehicles trips, depending upon transit ridership levels and the technology used for transit vehicles.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects anticipated not to have a net adverse or net beneficial, long-term effect.

Cumulative projects that could have a net, long-term, beneficial effect on the ambient noise environment include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by

expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park.

- Passenger rail improvements in the Amtrak San Joaquin Corridor (DOT, Amtrak) and potential creation of high-speed rail service would encourage travel by alternative (nonprivate vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resources Management Building (NPS) are two projects that would reduce in-Valley vehicle trips for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Improvement Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term adverse impacts on the local noise environment primarily due to construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle noise.
- Several other regional transportation projects that would have a net beneficial effect on noise by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS), and the Expansion of Mariposa County Transit System (Mariposa Co.).
- Update to the National Park Service's 1989 *Yosemite Wilderness Management Plan*.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would therefore have a beneficial, long-term effect on the ambient noise environment.

To the extent that the transportation-related projects cited above would replace automobile trips in the Valley with bus trips, the anticipated beneficial effect would depend upon ridership levels (and the corresponding number of automobile trips that would be avoided) and the technology selected for the buses. While a bus generates higher maximum noise levels than an automobile, a shift from auto to bus trips would reduce average roadside noise levels, assuming a certain number of auto trips would be displaced. For instance, a typical diesel-powered bus generates the same amount of noise as approximately 6 to 50 typical automobiles at speeds of 40 miles per hour or less (the difference between bus and auto noise is inversely related to speed), based on data compiled by the U.S. Department of Transportation (FHWA 1995). Assuming that a typical electric bus generates approximately 6 dBA less than a typical diesel bus, an electric bus generates the same amount of noise as approximately 2 to 13 typical automobiles. Thus, these

projects have the potential to contribute to a cumulative beneficial effect in the Valley, but also have the potential to offset some of the benefit with a combination of low ridership levels and typical diesel bus technology.

Implementation of an update to the *Yosemite Wilderness Management Plan* (NPS) would have a net beneficial, long-term effect on the ambient noise environment in the Merced River corridor because of the emphasis on improving visitor use management as it relates to naturally functioning ecosystems and a quality diverse wilderness experience.

Cumulative projects that could have a net, long-term, adverse effect on the ambient noise environment include:

- Various development-related projects, such as the Mariposa County General Plan Update (Mariposa Co.); Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan
- Wawona Campground Improvement (NPS)

Cumulative growth in the region would have localized, short-term, construction-related impacts; over the long term, these projects would have an adverse effect on local roadside noise levels due to increased vehicle trips. The Wawona Campground Improvement (NPS) would construct additional campsites, which may result in increased noise in Section 35.

Cumulative projects not anticipated to have a net adverse or beneficial effect on the ambient noise environment, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line; and South Fork Merced River Bridges Replacement (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration, Bridalveil Horse Camp Rehabilitation; and Yosemite Creek Campground Rehabilitation (NPS)
- Land exchanges, such as Yosemite View Parcel Land Exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camps, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on the ambient noise environment due to construction activities, and in some cases, these effects would occur within the corridor. Over the long-term, statewide growth and development would accelerate the national trend in increased air travel, resulting in a local, minor, long-term adverse effect in some portions of the corridor in wilderness areas due to increased aircraft overflights and associated intrusive noise levels. In non-wilderness areas, cumulative actions that would provide for increased transit use and reduced automobile use or that would reduce vehicle trips in the Valley could result in a local, minor, long-term, beneficial effect within the corridor depending upon the type of technology used for transit purposes and the extent to which private automobile trips are diverted to transit.

Since Alternative 1 would not involve any substantial construction projects, the local, short-term, adverse cumulative effects on noise due to construction activities that are cited above would be due to the cumulative projects. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 1; as discussed above, the national trend in air travel would result in a local, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the gradual increase in annual visitation to the park would likely offset the beneficial effects of those cumulative actions that would tend to reduce vehicle trips and their associated noise, resulting in a local, long-term, adverse effect on noise levels in those portions of the corridor through which roadways traverse.

Conclusions

The acoustical environment in wilderness areas would not be affected by Alternative 1, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Alternative 1 would accommodate a gradual increase in annual visitation, which would lead to a local, long-term, adverse effect along the various roads that traverse the corridor in non-wilderness areas.

Since Alternative 1 would not involve any substantial construction projects, the local, short-term, adverse cumulative effects on noise due to construction activities that are cited above would be due to the cumulative projects. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 1; as discussed above, the national trend in air travel would result in a local, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the gradual increase in annual visitation to the park would likely offset the beneficial effects of those cumulative actions that would tend to reduce vehicle trips and their associated noise, resulting in a local, long-term, adverse effect on noise levels in those portions of the corridor through which roadways traverse.

Cultural Resources

Archeological Resources

Analysis

General Impacts. The following discussion provides an overview of the types of archeological resource impacts that could occur within the Merced River corridor from application of Alternative 1.

Under Alternative 1, there would be no change in management and treatment of archeological sites in the Merced River corridor. Therefore, impacts to archeological resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to disturb intact archeological resources, which are identified as an Outstandingly Remarkable Value. Since the intensity of impacts would depend upon the nature, location, and design of the undertaking as well as the quantity and data potential of the archeological site(s) affected, it is not possible to determine the intensities of those impacts. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement (Advisory Council on Historic Preservation 1999). Every effort would be made during the design phase to avoid adverse impacts. Where such avoidance were not feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

Summary of Alternative 1 Impacts. There would be no change in the treatment and management of archeological resources as a result of Alternative 1. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's 1999 Programmatic Agreement.

Cumulative Impacts

Cumulative impacts to archeological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect archeological resources within the river corridor.

Past Actions. Archeological resources are subject to damage from development, vandalism, visitor access, and natural processes. For example, the 1997 flood exposed portions of two archeological resources in El Portal.

In general, the archeological resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous archeological resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem

and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. There are archeological resource sites in Yosemite Valley, El Portal, and Wawona that are considered to be at risk from existing facility development. These sites are at or adjacent to trails, structures, utility systems, and other facilities and are subject to ongoing disturbances such as trampling, surface collection, and ground disturbance associated with facility maintenance.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on archeological resources in the vicinity include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS)
- The *Yosemite Valley Plan* (NPS)
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- South Entrance/Mariposa Grove Site Planning (NPS)
- Resources Management Building, Yosemite West Rezoning Application, South Fork Merced River Bridges Replacement (NPS)
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS), Hazel Green Ranch (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI), Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and

Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)

- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Merced River Canyon Trail Acquisition (BLM)

The extensive grading and ground disturbance that could be required for these cumulative projects could disturb individual archeological resources. Each of these cumulative projects is within an archeologically sensitive area, such as a river valley or a mountain meadow. Any disturbance of an individual archeological resource is likely to have a long-term, moderate to major, adverse impact, with the intensity of the impact subject to design and final locations of proposed facilities.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on archeological resources. The intensity of the impact would depend upon design and final locations of proposed facilities.

Conclusion

There would be no change in the treatment and management of archeological resources as a result of Alternative 1. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's 1999 Programmatic Agreement.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on archeological resources. The intensity of the impact would depend upon design and final locations of proposed facilities.

Ethnographic Resources

Analysis

General Impacts. The following discussion provides an overview of the types of ethnographic resource impacts that could occur within the Merced River corridor from application of Alternative 1.

Under Alternative 1, there would be no change in management and treatment of ethnographic resources in the Merced River corridor. Therefore, impacts to ethnographic resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. Since the intensity of impact depends upon the nature, location, and design of the undertaking, as well as the quantity and nature of ethnographic resource(s) affected, it is not possible to determine the intensities of those impacts. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement (Advisory Council on Historic Preservation 1999). The

park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. Every effort would be made during the design phase to avoid adverse impacts. Where such avoidance were not feasible or prudent, the park, in consultation with culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in providing access to alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Summary of Alternative 1 Impacts. There would be no change in the treatment and management of ethnographic resources as a result of Alternative 1. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's 1999 Programmatic Agreement, and the park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses.

Cumulative Impacts

Cumulative impacts to ethnographic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative.

Past Actions. Ethnographic resources and their traditional cultural associations have been lost or damaged in Yosemite National Park through past development, visitor use, natural events, and widespread disruption of cultural traditions. Nevertheless, Yosemite National Park retains many sites and resources of significance to local and culturally associated American Indians.

In general, the ethnographic resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous ethnographic resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. No present actions have been identified that would affect ethnographic resources in the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects that could adversely affect ethnographic resources; and (2) projects that could beneficially affect ethnographic resources.

Examples of projects that could have a cumulative, adverse effect on ethnographic resources in the region include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The *Yosemite Valley Plan* (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Various development-related projects such as, the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); and Resources Management Building (NPS)
- Merced River Canyon Trail Acquisition (BLM)

All of these projects could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places. These projects would have a long-term, adverse impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were damaged and access to traditional use places were restricted.

Reasonably foreseeable projects that would beneficially affect ethnographic resources in the Merced River corridor include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan*, which will address land management issues within the wilderness (NPS)
- Update to the *Yosemite Fire Management Plan*, which has a goal of improving ecosystem health and meadow restoration (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS), both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park

- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

These cumulative projects could result in restoration of native plant habitat, which would be a long-term, beneficial impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were restored and access to traditional use places were continued.

The cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact on ethnographic resources because the long-term, beneficial impacts associated with the management of natural resources and river processes in the vicinity of the Merced River corridor would be partially offset by the long-term, adverse impacts associated with damaging gathering sites or restricting access to traditional use places.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact on ethnographic resources. The intensity of the impact would depend upon the extent of the management of natural resources and river processes.

Conclusion

There would be no change in the treatment and management of ethnographic resources as a result of Alternative 1. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's 1999 Programmatic Agreement, and the park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact on ethnographic resources. The intensity of the impact would depend upon the extent of the management of natural resources and river processes.

Cultural Landscape Resources, including Historic Sites and Structures

Analysis

The following discussion provides an overview of the types of cultural landscape resource impacts that could occur within the Merced River corridor from application of Alternative 1.

All cultural landscape resources, historic sites, and structures would continue to be managed as they are today. Therefore, impacts to cultural landscape resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to adversely affect historic resources, which are classified as an Outstandingly Remarkable Value. Impacts would be associated with maintenance activities that remove historic fabric, remove historic structures, or add incompatible facilities within or adjacent to historic structures. The intensity of impact would depend upon the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that are affected. These actions would be

subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impact.

There would be no change in the treatment and management of cultural landscape resources as a result of Alternative 1. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's 1999 Programmatic Agreement.

Cumulative Impacts

Cumulative impacts to cultural landscape resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative.

Past Actions. Cultural landscape resources have been lost or damaged in Yosemite through past development, visitor use, and natural events. In wilderness areas, cultural landscape resources include remnants of early stock grazing, trails, and work camps. In Yosemite Valley, Wawona, and El Portal, cultural landscape resources include early hotels, bridges, stores, studios, cabins, farms, and railroad structures that were associated with early Euro-American pioneer settlement and industries. In the Merced River gorge, cultural landscape resources include segments of the early wagon road and structures associated with hydropower generation. Rapidly disappearing structures and sites in other areas include homestead cabins, barns, road and trail segments, bridges, mining complexes, railroad and logging facilities, blazes, and campsites. These resources are reminders of the area's ranching, grazing, lumbering, and mining history.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects cultural landscape resources within the Merced River gorge. Cultural landscape resources are protected during construction by implementation of a compliance monitoring program.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could affect cultural landscape resources include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)

- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan*
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System (YARTS)), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- The Update to the *Yosemite Wilderness Management Plan*, which will address land management issues within the wilderness
- Several water improvement projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Merced River Canyon Trail Acquisition (BLM)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration

Given that each of these actions could result in removal of historic fabric or resources, add noncontributing elements to the historic cultural landscape, or add incompatible facilities within or adjacent to a cultural landscape resource, these cumulative projects would have a long-term, minor to major, adverse impact on cultural landscape resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on cultural landscape resources. The intensity of the impact would depend upon the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Conclusion

There would be no change in the treatment and management of cultural landscape resources as a result of Alternative 1. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's 1999 Programmatic Agreement.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on cultural landscape resources. The intensity of the impact would depend upon the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

National Historic Preservation Act Section 106 Summary

Under regulations of the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800.9) that address the criteria of effect and adverse effect, the National Park Service has determined that selection of this alternative would result in "no effect" to historic properties listed in or eligible for listing in the National Register of Historic Places. The California State Historic Preservation Officer has concurred with this determination.

Visitor Experience

Recreation

Analysis

General Impacts. The following discussion provides an overview of the types of visitor experience impacts that could occur within the Merced River corridor from application of Alternative 1.

Impacts in Wilderness. There would be no changes regarding access to campgrounds in the wilderness under this alternative. Existing facilities within wilderness segments of the Merced River corridor reflect current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Outstandingly Remarkable Values within wilderness segments include the pristine wilderness, and travel and camping in Little Yosemite Valley and at Merced and Washburn Lakes. These Outstandingly Remarkable Values would not be affected by this alternative.

Impacts in Yosemite Valley. Under the No Action Alternative, some activities could become more crowded because of an ongoing, long-term increase in the park's overall visitation. As a result, the characteristics of these activities could change. For example, fishing could become a more social experience as opposed to a solitary experience in certain parts of the river corridor. Changes in the quality of the experience would vary by recreational opportunity and location within the river corridor. Although a full range and diversity of recreational opportunities would still be available to visitors, there could be a local, long-term, adverse impact associated with recreation under Alternative 1 due to a continuing deterioration of the quality of the visitor experience.

Outstandingly Remarkable Values within Yosemite Valley include hiking, picnicking, camping, climbing, skiing, fishing, photography, swimming, nature study, horseback riding, biking, sightseeing, and boating. Continuing degradation of the quality of some of these Outstandingly Remarkable Values is considered to be a long-term, adverse impact under this alternative.

Impacts in the Merced River Gorge and El Portal. Recreation within the Merced River gorge and El Portal would remain consistent with existing conditions. In El Portal, people swim at Patty's Hole and near the sand pit. Fishermen access the river from the sand pit, as well as between Patty's Hole and the sand pit. These areas would not be affected.

Outstandingly Remarkable Values within the Merced River gorge and El Portal include picnicking, climbing, fishing, photography, sightseeing, and white-water use. These Outstandingly Remarkable Values would not be affected under this alternative.

Impacts in Wawona. Recreational use of Wawona would remain similar to existing conditions. Outstandingly Remarkable Values within Wawona include hiking, picnicking, camping, skiing, fishing, photography, swimming, nature study, horseback riding, biking, sightseeing, and boating. These Outstandingly Remarkable Values would not be affected under this alternative.

Summary of Alternative 1 Impacts. Under Alternative 1, availability and diversity of recreational opportunities in the river corridor would continue as presently managed. Activities such as the use of non-motorized watercraft (e.g., rafts, inner tubes, kayaks), swimming and wading, hiking, backpacking, camping, rock climbing, fishing, sightseeing, photography, nature study, bicycling, and stock use would continue to be available at existing levels. Trails and campgrounds within the corridor would be maintained in their current locations. Alternative 1 therefore would have no impact on recreation in Yosemite National Park. The river environment would continue to degrade, and this continuing degradation would have a long-term, adverse effect on the quality of the riverine environment for recreational activities.

Cumulative Impacts

Cumulative impacts on visitor experience as it relates to recreation are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified include only those that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions would have a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities (e.g., restrooms) that mitigate adverse effects associated with visitor use.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on visitor experience. Short-term, construction-related effects include travel delay and closure of the area to recreational use. Those effects are mitigated by implementation of a traffic control plan with measures such as strict construction timing restrictions, roadway safety procedures, and the use of flaggers, and signals. Long-term effects are improved access to recreational opportunities along the river corridor and El Portal Road, and easier, more dependable, and safer access for recreational vehicles, buses, and other vehicles to Yosemite Valley and other park destinations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both adverse and beneficial effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to recreation include:

- The Yosemite Area Regional Transportation System (YARTS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River Canyon Trail Acquisition (BLM)

These projects would provide increased access for visitors to the park and expand recreational opportunities in the vicinity of the park.

Reasonably foreseeable projects that could have both adverse and beneficial impacts include:

- The *Yosemite Valley Plan* (NPS)
- The Update to the *Yosemite Wilderness Management Plan* (NPS)

These projects have the potential to enhance the quality of the visitor experience in the wilderness and Yosemite Valley but also could result in the removal of existing recreational facilities. For example, the *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could be considered a local, long-term, adverse impact to some users, due to the loss of a unique lodging experience in the wilderness. This action could also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness, a reduction in stock impacts, improvements in scenic and natural quiet, and improvements in opportunities for solitude and a primitive and unconfined recreational experience.

Reasonably foreseeable projects that could have a net adverse effect on visitor experience include:

- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); Hazel Green Ranch (Mariposa Co.); and the Yosemite West Rezoning Application (NPS)

These projects could increase visitor use in the park and in the river corridor and could contribute to increased congestion and reduce the quality of specific, solitude-based recreational opportunities in the park.

The cumulative projects would have a long-term, negligible, beneficial impact, because the beneficial impacts associated with increased visitor access and expanded recreational opportunities would be partially offset by the adverse impacts associated with the removal of specific recreational opportunities.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact on recreation, because an increase in visitor access and an expansion of recreational opportunities would only be partially offset by the removal of specific recreational opportunities.

Conclusions

Under Alternative 1, availability and diversity of recreational opportunities in the river corridor would continue as presently managed. Activities such as the use of non-motorized watercraft (e.g., rafts, inner tubes, kayaks), swimming and wading, hiking, backpacking, camping, rock climbing, fishing, sightseeing, photography, nature study, bicycling, and stock use would continue to be available at existing levels. Trails and campgrounds within the corridor would be maintained in their current locations. The river environment would continue to degrade, and this continuing degradation would have a long-term, adverse effect on recreational activities.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact on recreation, because an increase in visitor access and an expansion of recreational opportunities would only be partially offset by the removal of specific recreational opportunities.

Interpretation & Orientation

Analysis

General Impacts. The following discussion provides an overview of the types of impacts on interpretation and orientation that could occur within the Merced River corridor from application of Alternative 1.

Impacts in Wilderness. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue as currently managed.

Impacts in Yosemite Valley. Interpretation and orientation services include programs offered at the Yosemite Valley Visitor Center, The Ansel Adams Gallery, Lower Pines Campground amphitheater, ranger-led walks and talks, and other related park partner programs. The diversity and availability of programs would continue under the existing management approach.

The main Valley Visitor Center is difficult to find, and although it is centrally located in Yosemite Village, directional signs in Yosemite Valley are not ideal and there is no adjacent parking. This situation would continue under Alternative 1 and could constitute an adverse impact on visitor experience, as visitors wander around the Valley in search of the Visitor Center. Relocation of this facility is not considered under Alternative 1; however, the proper placement of improved signs and directional information could mitigate this impact.

Some interpretive and educational services and facilities provided by the National Park Service and the park partners (Yosemite Institute, Yosemite Association, Yosemite Fund, Sierra Club, Yosemite Concession Services, and The Ansel Adams Gallery) would continue at present levels and in present locations throughout the park.

Impacts in the Merced River Gorge and El Portal. There are no interpretive programs currently offered in the gorge or in El Portal. Under Alternative 1, this condition would not change.

Impacts in Wawona. Interpretation and orientation services include programs offered at the Pioneer Yosemite History Center, Wawona Campground amphitheater, ranger-led walks and talks, and other related park partner programs. The diversity and availability of programs would continue under the existing management approach.

Summary of Alternative 1 Impacts. The availability and diversity of interpretation and orientation programs and services would not change under Alternative 1. This alternative provides flexibility in terms of where exhibits could be placed, trails built, and programs offered for the benefit of visitors.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to orientation and interpretation are based on analysis of past and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect visitor interpretation and orientation within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under the jurisdiction of these agencies. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to orientation and interpretation include:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)

These projects could enhance the quality of the visitor experience by expanding interpretation and orientation services in Yosemite Valley and Wawona.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The Update to the *Yosemite Wilderness Management Plan* (NPS)

This planning effort could prescribe the closure of the Merced Lake High Sierra Camp. The potential discontinuation of visitor use of the Merced Lake High Sierra Camp would disrupt the High Sierra Camp loop-trip experience and the ranger-led interpretive hikes in the wilderness. On

the other hand, this could result in a beneficial effect for other user groups who would benefit from a reduction in facilities in the wilderness and enhanced opportunities for solitude and self-guided interpretive experiences.

The cumulative projects would have a long-term, minor, beneficial impact, because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by the potential loss of ranger-led hikes in the wilderness.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact because the availability and diversity of interpretation and orientation programs and services would increase.

Conclusions

The availability and diversity of interpretation and orientation programs and services would not change under Alternative 1. This alternative provides flexibility in terms of where exhibits could be placed, trails built, and programs offered for the benefit of visitors.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact because the availability and diversity of interpretation and orientation programs and services would increase.

Visitor Services

Analysis

General Impacts. The following discussion provides an overview of the types of impacts on visitor services that could occur within the Merced River corridor from application of Alternative 1.

Impacts in Wilderness. Under Alternative 1, the availability and diversity of visitor services in the wilderness would not change from what is currently available. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) and lodging at the Merced Lake High Sierra Camp would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. In the wilderness, camping is controlled through the quota system as part of the *Wilderness Management Plan*, and although the park is able to accommodate visitor demand parkwide, there is unmet demand for wilderness permits in the Merced River corridor.

Impacts in Yosemite Valley. Under Alternative 1, the availability and diversity of visitor services would not change from what is currently available to the visitor in Yosemite Valley. Visitor services include camping (e.g., Camp 4 (Sunnyside Campground), North Pines Campground, Upper and Lower Pines Campgrounds, and the backpackers campground at Tenaya Creek), lodging (e.g., Curry Village, Housekeeping Camp, Yosemite Lodge, and The Ahwahnee), and food and retail services.

At present, visitor demand for camping and lodging in Yosemite Valley is unmet during the summer months. During these peak months, Camp 4 (Sunnyside Campground), North Pines Campground, Upper Pines Campground, and Lower Pines Campground are generally full.

In addition, Housekeeping Camp, Curry Village, and Yosemite Lodge (which is at capacity year-round) are typically full in the peak months. The park's inability to meet camping and lodging demand in Yosemite Valley was exacerbated by the damage sustained during the 1997 flood. Campsites that were closed as a result (e.g., Upper River and Lower River Campgrounds) would not necessarily be reopened under this alternative. Some units at Yosemite Lodge were also removed due to damage and would not be replaced.

No further direction beyond existing park plans would be provided regarding rebuilding, relocating, or removing camping and lodging facilities, with an unknown impact on the number of campsites or lodging units within the park. Thus, the number of campsites and lodging units in the corridor could increase, decrease, or stay the same under Alternative 1.

It is possible that Alternative 1 could perpetuate the inability to meet demand for camping and lodging, or it could alleviate some of the current unmet demand. It is possible that some segment of the visitor population might, as a result, choose to visit the park during other times of the year. Some visitors would be forced to plan further ahead to secure camping and lodging accommodations during peak times, if there were to be no change or a decrease in numbers of campsites and lodging units. The inability to meet camping and lodging demand could constitute an adverse impact, because some visitors likely would be displaced as a result of an insufficient number of campsites and lodging units in the park.

The National Park Service, park partners, and the primary park concessioner would continue to operate food service and retail outlets in Yosemite Valley, and thus could continue to meet demand. As a result, Alternative 1 would have no impacts associated with these aspects of visitor services.

Impacts in the Merced River Gorge and El Portal. Visitor services currently offered in the gorge include picnicking, lodging, and restaurants run by private businesses, and a store and gas station operated as park concessions. These services would not be affected by Alternative 1.

Impacts in Wawona. During peak summer months, Wawona Campground and the Wawona Hotel are typically full. Under Alternative 1, this condition would not change, which would further exacerbate the park's ability to meet demand for camping and lodging, especially during peak summer months. The existing concession-operated food and retail services in Wawona would continue to operate at present levels.

Summary of Alternative 1 Impacts. Alternative 1 could perpetuate the inability to meet demand for camping and lodging. This is considered a potential long-term, adverse impact on the availability and diversity of visitor services.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to visitor services are discussed herein and are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. Upper and Lower River Campgrounds and part of Lower Pines Campground were closed following damage sustained during the 1997 flood. This resulted in a decrease in the overall number of campsites available to visitors in the Valley. Similarly, lodging units at the Yosemite Lodge were removed as a result of flood damage and have not been replaced.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect, and (3) projects anticipated to have a mixed effect.

Examples of projects that could have a cumulative beneficial effect on visitor services include:

- The Yosemite Area Regional Transportation System (YARTS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Garrotte Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); and the Yosemite West Rezoning Application (NPS).

These projects could improve transportation to and from the park, which would ultimately have a beneficial effect on visitor services by providing increased access for visitors staying outside the park. In addition, the number of campsites and lodging units in the park and in the park vicinity could increase, which would improve visitor services for park visitors.

Reasonably foreseeable projects that could have a net adverse effect on visitor services include:

- The Update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. This change could affect the ability to meet the lodging demand in the corridor and park and could be considered an adverse impact due to the loss of a unique lodging experience in the wilderness.

Examples of projects that could have a cumulative mixed effect on visitor services include:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* proposes restoration of degraded areas and a reduction of development within the Merced River ecosystem while enhancing the quality of the visitor experience in

Yosemite Valley. Visitor services could be improved by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The *Yosemite Valley Plan*, however, would prescribe a reduction in camping and lodging units in Yosemite Valley, which would have an adverse effect on the provision of visitor services.

These cumulative projects would have a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on visitor services because of the potential reduction of camping and lodging opportunities in Yosemite Valley and the potential removal of the High Sierra Camps. This adverse impact would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Conclusions

Alternative 1 could perpetuate the inability to meet demand for camping and lodging. This is considered to be a potential long-term, adverse impact on the availability and diversity of visitor services.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on visitor services because of the potential reduction of camping and lodging opportunities in Yosemite Valley and the potential removal of the High Sierra Camps. This adverse impact would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Wilderness Experience

Analysis

General Impacts. The following discussion provides an overview of the types of impacts on wilderness experience that could occur within the Merced River corridor from application of Alternative 1.

Under Alternative 1, access to Yosemite wilderness within the corridor would continue as currently managed under the wilderness permit system and *Wilderness Management Plan*. Additionally, group and primitive camping experiences, hiking opportunities, and opportunities for solitude in the wilderness would remain unchanged. At present, the park is able to accommodate visitor requests for wilderness permits parkwide; however, demand for permits specifically in the Merced River corridor typically exceed demand as controlled by the quota system. The quota system helps to maintain the management direction that visitors have the ability to experience solitude and engage in a primitive camping experience in the wilderness.

This inability to meet demand for wilderness permits in the Merced River corridor would likely continue under Alternative 1.

Summary of Alternative 1 Impacts. Alternative 1 would continue the current management practices for the wilderness area. Since the inability to meet demand for wilderness permits would continue, this is a long-term, adverse impact.

Cumulative Impacts

Cumulative effects on the wilderness experience are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect the wilderness experience within the river corridor or in the park vicinity.

Past Actions. The wilderness permit/trailhead quota system, established in 1974-76 set limits for the numbers of people allowed to enter the wilderness per day per trailhead. These limits were based on extensive research and monitoring to assess capacity based on ecological and social considerations, and were in response to exceptionally high levels of use in the early to mid-1970s. This system has had beneficial impacts on the wilderness experience through implementation of a quota system to protect natural resources.

Present Actions. The wilderness permit/trailhead quota system continues to limit and/or disperse use based on trailhead access, and thus provides the beneficial impact of improved experience of natural values due to resource protection.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to wilderness experience include:

- Several planning or restoration efforts are in various stages of development, including the *Fire Management Plan* (NPS); the *Fire Management Action Plan for Wilderness* (USFS); the *Sierra Nevada Framework for Conservation and Collaboration* (USFS); *Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses* (USFS); the *Pinecrest Basin Forest Plan Amendment* (USFS, Stanislaus); the *Tuolumne Meadows Development Concept Plan* (NPS); and *Tuolumne Wild and Scenic River Management Plan* (NPS)
- The Merced Canyon River Trail Acquisition (BLM)

These projects could result in the restoration of wilderness areas within the park and in the park vicinity. Any improvement to the wilderness ecosystem is considered to be a long-term, beneficial impact.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The Update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could affect the ability to meet lodging demand and would impact some users due to the loss of a unique lodging experience in the wilderness. In addition, the potential discontinuation of visitor use of the High Sierra Camps would eliminate the High Sierra Camp loop-trip experience. On the other hand, this action might also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness and a reduction in stock impacts. These individuals could benefit from improvements in scenic and natural quiet qualities, opportunities for solitude, and an overall primitive recreational experience.

These cumulative projects would have a long-term, minor, beneficial impact on the wilderness experience, because the wilderness ecosystem would be improved and would only be partially offset by the long-term, adverse impact of removing the High Sierra Camps.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse removal of the High Sierra Camps.

Conclusions

Alternative 1 would continue the current management practices for the wilderness area. Since the inability to meet demand for wilderness permits would continue, this is a long-term, adverse impact.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse removal of the High Sierra Camps.

Social Resources

Land Use

Analysis

General Impacts. Because the basic land use designation of Yosemite National Park (i.e., public parklands) would not change under Alternative 1, and because National Park Service policy concerning the acquisition of private lands within or adjacent to the park is compatible with current plans and policies, Alternative 1 would have no land use impacts.

Private property within the river corridor in El Portal and Wawona is not zoned under the *Merced River Plan*. Alternative 1 would not result in conflicts with existing land uses or existing plans and policies and would not induce changes in those land uses.

Section 8 of the Wild and Scenic Rivers Act withdraws lands within the boundaries of Wild and Scenic Rivers from “public entry, sale, or disposition under the public land laws of the United States.” This section of the Wild and Scenic Rivers Act preempts public land laws, such as the 1872 General Mining Act, under which nonreserved public lands may be disposed of for private use. However, because Yosemite National Park is by definition “reserved land,” no additional lands have been identified for withdrawal under the *Merced River Plan*. Furthermore, much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772).

In accordance with Section 9 of the Wild and Scenic Rivers Act, lands within one-quarter mile of the main stem and South Fork of the Merced River have been withdrawn from all forms of appropriation under mining and mineral leasing laws of the United States. Because much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772), no additional lands have been identified for withdrawal under the *Merced River Plan*.

Summary of Alternative 1 Impacts. Since the basic land use of the park would not change, no impacts to land uses would occur as a result of Alternative 1.

Cumulative Impacts

Cumulative impacts to land use discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect land use within the river corridor and in the immediate vicinity of Yosemite National Park.

Past Actions. In general, land uses in the Merced River corridor have been determined by past decisions on the development, relocation, and removal of specific facilities. Development within the Merced River corridor has occurred since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general

management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) does not affect the land uses within the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that are anticipated to change overall land uses can be separated into local and regional projects. Local projects (i.e., those within the park and involving parklands) being carried out under the direction of the National Park Service include:

- The *Yosemite Valley Plan*, the Yosemite View parcel land exchange, El Portal; South Entrance/Mariposa Grove Site Planning; Resources Management Building; Yosemite West Rezoning Application; Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan; Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and Crane Flat Campus Redevelopment (NPS, YNI)
- Several Yosemite campground rehabilitation projects, such as at Tamarack Campground, Bridalveil Horse Camp, Yosemite Creek Campground, Hodgdon Meadow Campground, and the Wawona Campground Improvement (NPS)

Local projects have the potential to change land uses within the park. For example, the *Yosemite Valley Plan* could change existing land uses and the intensity of existing land uses within portions of the Merced River corridor in Yosemite Valley as well as in El Portal and Wawona. These changes to land uses would be dictated by the development plans outlined in the *Yosemite Valley Plan*.

Another example of a local project is the land exchange between the National Park Service and the owner of a parcel of private property near the park's western entrance at the El Portal Administrative Site. The owner of the private parcel would receive a plot of National Park Service land adjacent to the owner's hotel properties in exchange for the landowner's plot two miles west of the Arch Rock Entrance Station. This land exchange would allow the National Park Service to construct facilities, such as a vehicle turnaround area, that would increase the vehicle handling efficiency of the entrance station. The U.S. Congress has passed legislation allowing this land exchange to occur, but it is not yet completed. Though completion of the land exchange would alter the land use for those two plots of land, the overall effect would be insignificant, because the two plots of land are close together and there would be no net change in the amount of each type of land use in the area. A similar land exchange would also take place in Wawona. The Seventh Day Adventist recreational camp is located in Wawona on privately owned land inside the boundaries of Yosemite National Park. The privately owned land occupied by the camp literally abuts portions of Yosemite's designated Wilderness. To protect designated Wilderness, this project would exchange lands between the National Park Service and the Seventh Day Adventist camp.

Regional projects (those that take place outside of the park) that would affect land use and planning within the Yosemite region and are not under National Park Service jurisdiction include:

- Projects undertaken by county governments include: Hazel Green Ranch (Mariposa Co.); Mariposa County General Plan Update (Mariposa Co.); Yosemite Motels, El Portal (Mariposa Co.); Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); Buildout of the City of Merced, General Plan (City of Merced); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); and Evergreen Road Improvements (multi-agency, see Appendix G)
- Projects undertaken by federal agencies include: South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM); Sierra Nevada Framework for Conservation and Collaboration (USFS); and Merced River Canyon Trail Acquisition (BLM)

Regional projects have the ability to alter land use in the park vicinity. An example of such a project would be the Mariposa County General Plan Update, which is scheduled to begin in 2000. Although the plan does not explicitly call for land use changes, it does provide general guidance for land use, zoning, and development throughout Mariposa County, which could likely impact land use in the long term.

Another regional project that could affect land use is the *South Fork and Merced Wild and Scenic River Implementation Plan*. This plan covers management of lands along river segments including: a 15-mile portion of the main stem extending from the El Portal Administrative Site to a point 300 feet upstream of the confluence with Bear Creek; a 21-mile segment of the South Fork from the park boundary to the confluence of the Merced River; and a 3-mile segment of the South Fork just upstream of Wawona, where the National Park Service has jurisdiction over the north side of the river and the U.S. Forest Service has jurisdiction over the south side. The plan calls for the long-term protection of natural and cultural resources, and managing the area for the use and enjoyment of visitors in a way that will leave the resource unimpaired for future use and enjoyment as a natural setting.

The impact intensity of planning projects would depend upon the extent to which the plan's recommendations were implemented. Land uses would most likely shift in various areas. The short-term impacts on land use would be neither adverse nor beneficial; likewise, long-term impacts on land use would be neither adverse nor beneficial.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Conclusions

Since the basic land-use designation would not change, no impacts to land uses would occur as a result of Alternative 1.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Transportation

Analysis

General Impacts. The following discussion provides an overview of the types of transportation impacts that could occur within the Merced River corridor from application of Alternative 1.

Camping, lodging, parking, and circulation facilities are assumed to remain as they are under existing conditions. Operational improvements (e.g., new signs to more efficiently direct visitors to destinations) could be made under Alternative 1, but no such improvements are assumed for this analysis. Some lodging facilities at Yosemite Lodge that were damaged by the 1997 flood were repaired. Other camping and lodging facilities damaged by, and/or removed after, the 1997 flood, however, would not be repaired or rebuilt under Alternative 1, and such facilities undamaged by the flood would remain. Parking for private automobiles and commercial tour buses would remain dispersed at sites and turnouts throughout the Merced River corridor. Shuttle bus routes would most likely continue to serve only the east Valley. The Restricted Access Plan would continue to be implemented to manage visitor access during periods of high visitation when there were more vehicles than available parking spaces and, in some instances, than roads could accommodate.

Traffic congestion and delays would continue to occur at busy intersections and could worsen somewhat as visitation levels increase in the future. This could trigger the need to implement the Restricted Access Plan on an increasing number of days during the peak season. It is expected that increases in visitation levels would occur primarily during the current nonpeak periods (e.g., during months on either side of peak summer months, and on weekdays during peak summer months). If that were to occur, then traffic congestion during those nonpeak periods could approximate current congestion during peak periods. Increases in visitation during peak periods also could occur, and to the degree that such increases happen, congestion would marginally worsen. Increasing congestion and delays would be a long-term, adverse impact on traffic conditions.

Parking demand likely would exceed parking availability, which could trigger the need to implement the Restricted Access Plan on an increasing number of days during the peak season. Visitors would continue to be able to drive their private vehicles, but many would not be able to find parking spaces near their destinations and would need to park in roadside spaces or spend more time searching for parking. The need to park in roadside spaces could increase conflicts between vehicles, as visitors unable to find an authorized space could decide to park in unauthorized/improper areas. This would have a long-term, adverse impact on traffic safety conditions by slightly increasing the potential for traffic safety hazards.

Summary of Alternative 1 Impacts. Increases in visitation during peak periods could occur, and congestion and delays would be a long-term, adverse impact on traffic conditions. Parking demand likely would exceed parking availability, which could trigger the need to implement the Restricted Access Plan on an increasing number of days during the peak season. Visitors would

continue to be able to drive their private vehicles, but many would not be able to find parking spaces near their destinations and would need to park in roadside spaces or spend more time searching for parking. The need to park in roadside spaces could increase conflicts between vehicles, as visitors unable to find an authorized space could decide to park in unauthorized/improper areas. This would have a long-term, adverse impact on traffic safety conditions by slightly increasing the potential for traffic safety hazards.

Cumulative Impacts

Cumulative transportation effects discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect access and transportation in the vicinity of the river corridor.

Past Actions. Development of a circulation system that includes roadways, parking areas, and bridges has occurred within and in the vicinity of Yosemite National Park. This circulation system was developed to provide access to the park and the surrounding areas. In the 1980s, the Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles until the traffic volume and parking demand in the Valley decreases sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on transportation. Short-term, construction-related effects include visitor delays and safety hazards through the construction work zone. Those effects are mitigated by implementation of a traffic control plan, with measures such as strict construction timing restrictions, roadway safety procedures, flaggers, and signalling. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which would be a long-term, beneficial impact.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; (3) projects anticipated to have adverse effects; and (4) projects not anticipated to have a net adverse or beneficial effect.

Reasonably foreseeable projects that could have a cumulative, long-term, beneficial effect on regional transportation include the following:

- The Yosemite Area Regional Transportation System (YARTS)
- San Joaquin Corridor Rail Projects (DOT, Amtrak)
- The Yosemite West Rezoning Application (NPS)
- The *Yosemite Valley Plan* (NPS)

The aforementioned projects, individually and in combination, would reduce congestion by encouraging travel to the park by alternative (non-private vehicle) modes. For example, YARTS is a collaborative, multi-agency effort to evaluate the feasibility of a regional transportation

system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion. The initial YARTS service would be a demonstration project (scheduled to begin by early summer 2000), with a target market of visitors staying overnight in the gateway communities and employees working at Yosemite National Park who live in the gateway communities. A successful YARTS would reduce the number of day visitors arriving in private vehicles. Similarly, the Yosemite West Rezoning Application would include a provision for a regional staging area to provide visitor parking and linkage to regional public transportation systems. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. The circulation pattern in Yosemite Valley would be changed by the removal of roads from Ahwahnee and Stoneman Meadows, the removal of parking from Curry Orchard, the conversion of Northside Drive to a multi-use (bicycle and pedestrian) paved trail from El Capitan crossover to Yosemite Lodge, and the conversion of Southside Drive to two-way traffic between El Capitan crossover and Curry Village. The implementation of these projects would result in a reduction in automobile congestion within Yosemite Valley. In addition, parking lots(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.

Reasonably foreseeable projects that could have a short-term, adverse effect but a cumulative, long-term, beneficial effect on regional transportation include:

- Highway 41 Extension (Madera Co.)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.)
- Mariposa Creek Pedestrian/Bike Path (Mariposa Co.)
- Evergreen Road Improvements (multi-agency, see Appendix G)

Although the above projects would have site-specific and short-term, adverse effects (e.g., construction-related transportation effects), the general goal of each of these projects is to improve regional transportation circulation and safety.

Reasonably foreseeable projects that could have a short-term, adverse effect on regional transportation include:

- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley

Sewer Line (NPS); Cherry Dam Fuse Gate, O’Shaughnessy Dam Well, and O’Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

- Forest-related projects, such as the Orange Crush Fuels Treatment Projects and the A-Rock Reforestation (USFS, Stanislaus), and the Rogge–Ackerson Fire Reforestation (Tuolumne Co.)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); Crane Flat Campus Redevelopment (NPS, YNI); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and the new Resources Management Building (NPS)

The adverse effects associated with the above projects would be short term in nature, primarily related to construction-generated traffic on roadways serving the project sites. These projects would not result in any net, long-term effects to regional transportation.

Given the potential for a reduction in the number of day visitors arriving in private vehicles, these cumulative projects would have a long-term, minor to moderate, beneficial impact on the regional transportation system. The impact intensity of any planning projects would depend upon the extent that the plan’s recommendations are implemented. The short-term, construction-related traffic impacts that would occur from development of site-specific projects would not appreciably alter these long-term, beneficial impacts.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse or beneficial impact on traffic and traffic safety conditions in Yosemite National Park, because the beneficial impacts associated with the cumulative projects would be offset by the adverse impacts associated with Alternative 1, including the potential increase in traffic congestion within Yosemite Valley and the potential increase in traffic safety hazards. Whether the impact is adverse or beneficial depends on the implementation of various projects that would benefit the transportation system.

Conclusions

Increases in visitation during peak periods could occur, and congestion and delays would be a long-term, adverse impact on traffic conditions. Parking demand likely would exceed parking availability, which could trigger the need to implement the Restricted Access Plan on an increasing number of days during the peak season. Visitors would continue to be able to drive their private vehicles, but many would not be able to find parking spaces near their destinations and would need to park in roadside spaces or spend more time searching for parking. The need to park in roadside spaces could increase conflicts between vehicles, as visitors unable to find an authorized space could decide to park in unauthorized/improper areas. This would have a long-term, adverse impact on traffic safety conditions by slightly increasing the potential for traffic safety hazards.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse or beneficial impact on traffic and traffic safety conditions in Yosemite National Park, because the beneficial impacts associated with the cumulative projects would be offset by the adverse impacts associated with Alternative 1, including the potential increase in traffic congestion within Yosemite Valley and the potential increase in traffic safety hazards. Whether the impact is adverse or beneficial depends on the implementation of various projects that would benefit the transportation system.

Scenic Resources

Analysis

Impacts in the Wilderness. Scenic resources and views from the Merced River and its banks within the wilderness reaches are generally pristine, except where human use is relatively intense (e.g., in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, and Merced Lake High Sierra Camp and Backpackers Campground). Under Alternative 1, use of these facilities would continue consistent with existing conditions, and scenic resources at these locations could remain somewhat impaired.

Scenic Outstandingly Remarkable Values of the wilderness reaches of the Merced River include views of the glaciated Merced Lake and Washburn Lake river canyon, Bunnell Cascades, the confluence of tributaries, and the Clark and Cathedral Ranges. Because of the relatively remote location, continuation of current management direction under Alternative 1 is not anticipated to affect these resources.

Impacts in Yosemite Valley. Under Alternative 1, the Merced River could continue to widen in certain areas as a result of human-caused erosion, loss of bank vegetation, and trampling. For this reason, and because Alternative 1 would not address the effect of crowding on enjoyment of scenic resources, the alternative could have an adverse effect on the physical landscape features that determine the character of a given scenic view or sequence of views. It also could affect the ability of visitors to enjoy certain scenic views, including many of the highly valued scenic resources in Yosemite Valley identified in the 1980 *General Management Plan*. This effect would be directly related to the number of people traveling in the Merced River corridor, the duration of their stay, the density of people gathered at specific views, and the extent and effectiveness of minor restoration programs that could occur under the No Action Alternative. These factors affect both the amount of physical damage caused by humans on the features that define important scenic resources in the park, and the ability of people to experience scenic resources in relative solitude.

Existing facilities and visitor use patterns could continue to affect natural vegetation and soil patterns, reducing vegetative cover and altering natural vegetative patterns. An example includes increased encroachment of conifers within meadow and riparian communities that could, over time, alter the character of a given scenic view or sequence of views or obscure the scenic view altogether.

Overall, park visitation could increase over existing levels, although the increase in park visitation by 2020 is not quantifiable. Though applicable throughout the park, human-caused erosion and crowding is likely to be much more of an issue in Yosemite Valley than in the wilderness, El Portal, or Wawona due to the Valley's much higher concentration of visitors. Efforts to manage visitation and protect scenic resources in high-use areas, such as Yosemite Valley, under the No Action Alternative would be conducted in a piecemeal fashion. In the absence of a comprehensive planning effort to manage increased visitation and maintain and restore natural communities, Alternative 1 would result in a local, long-term, adverse impact on scenic resources, including some of those scenic resources identified in the 1996 *Draft Yosemite Valley Housing Plan* as Outstanding Remarkable Values in Yosemite Valley.

Impacts in the Merced River Gorge and El Portal. Scenic resources and views from the Merced River and its banks within the Merced River gorge are generally intact, except where facilities intrude upon the natural character. Under Alternative 1, use of these facilities would continue consistent with existing conditions, although the numbers of park visitors accessing these facilities could increase over current levels. In the absence of comprehensive planning efforts to manage increased visitation and maintain and restore natural communities, scenic resources at these locations could be negatively affected by increased visitor use. Increased visitor use and its resultant effects on scenic resources (e.g., degradation of resources, trampling, crowding) could have local, long-term, adverse effects on scenic resources at these locations. Scenic Outstandingly Remarkable Values of the Merced River gorge include views of cascades and waterfalls, the Rostrum, Elephant Rock, and the V-shaped river gorge. Because they are not easily accessible, continuation of current management direction under Alternative 1 is not anticipated to affect these resources.

The El Portal Administrative Site was established by Congress in 1958 to allow relocation of operations and maintenance utilities, facilities, and services out of Yosemite National Park. Since El Portal is an administrative site with substantial existing development, scenic Outstandingly Remarkable Values are not attributed to the El Portal Administrative Site. While there are scenic resources in El Portal, these scenic resources are not exemplary on a regional or national scale.

Impacts in the South Fork. Scenic resources and views from the Merced River and its banks along the South Fork are generally pristine. Since park visitation could increase over existing levels, Wawona would experience a higher concentration of visitors in 2020. Efforts to manage visitation and protect scenic resources in Wawona under the No Action Alternative would be conducted in a piecemeal fashion. In the absence of a comprehensive planning effort to manage increased visitation and maintain and restore natural communities, Alternative 1 would result in a local, long-term, adverse impact on scenic resources in accessible areas of Wawona, including those scenic resources identified in the 1996 *Yosemite Valley Draft Housing Plan*, such as historic vistas, and views of the confluence and cascades of Chilnualna Creek. Trampling, crowding, and degradation of resources could adversely affect the scenic resources in these areas. Other segments of the South Fork, such as the wilderness and the length of the river below Wawona within the park, are not easily accessible to visitors. Continuation of current management direction under Alternative 1 is not anticipated to affect the scenic resources in these areas. Scenic Outstandingly Remarkable Values of the Wilderness segment and the length of the river below

Wawona within the park include views of the Triple Divide Peak, the Sierra Crest, and continual white-water cascades in the deep and narrow canyon of the South Fork.

Summary of Alternative 1 Impacts. In the absence of a comprehensive planning effort to manage increased visitation and maintain and restore natural communities, Alternative 1 would have a local, long-term, adverse impact on scenic resources in developed and easily accessible areas.

Cumulative Impacts

Cumulative impacts to scenic resources discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect scenic resources within the river corridor or in the immediate park vicinity.

Past Actions. Scenic resources have been affected by numerous past actions since the inception of the park. Primary among these, when considered in relation to the potential effects of the *Merced River Plan*, is the alteration of natural communities caused by Euro-American settlers who lived in the park. For example, attempts to establish agricultural activities and the development of tourism resulted in the drying out of the Valley by breaching the moraine and controlling naturally occurring fires, which affected vegetation patterns along the Merced River. Broad-leafed trees along the riverbanks were replaced by the comparatively dense stands of conifers that exist today. This has had a local, long-term, adverse effect on scenic resources, as the conifers now block views of important scenic resources that were viewable before the vegetation patterns were changed.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor, and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Projects that could have a cumulative beneficial effect on scenic resources include those that could reduce the number of vehicles entering the park and therefore the frequency of intrusion of vehicles into the scenic landscape. Projects that improve the general health of ecosystems viewable from or within the Merced River corridor also would result in a net cumulative, beneficial effect on scenic resources. Examples of these types of projects are:

- The Yosemite Area Regional Transportation System (YARTS)

- Yosemite Valley Shuttle Bus Stop Improvements (NPS).
- Update to the *Yosemite Fire Management Plan* (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams, Dinkey Lakes, and Monarch Wildernesses (USFS)

The general goal of these projects is to either reduce private vehicle traffic in the park, and especially in Yosemite Valley (which would reduce the frequency of vehicles intruding into important scenic resources viewable within or from the Merced River corridor), or to improve the health of ecosystems that make up parts of important scenic resources, either in the park or on lands adjacent to the park. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and restoring natural vegetation. These cumulative projects would have a net long-term, beneficial impact on scenic resources.

Reasonably foreseeable projects that could have an adverse effect on scenic resources include:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Yosemite View parcel land exchange, El Portal (NPS)

The local, long-term, adverse effects of these reasonably foreseeable projects would be related to the potential introduction of new structures and/or infrastructure that would intrude into views of important scenic resources within or viewable from the Merced River corridor. For example, the Yosemite View parcel land exchange could result in new development in an area of El Portal that is currently undeveloped and a reduce the vegetative screening of the existing motel complex. This project would result in increased views of developed structures on the banks of the Merced River from Highway 140.

Reasonably foreseeable projects that could have a mixed effect on scenic resources include:

- The *Yosemite Valley Plan* (NPS)
- Wawona Campground Improvement (NPS)

The *Yosemite Valley Plan* would have a local, long-term, beneficial impact on scenic resources in the Valley due to restoration of disturbed or developed land to natural conditions and, in particular, large-scale restoration of areas within the A-scenic category (areas considered to have the most significant scenic views within the Valley). The *Yosemite Valley Plan* also would include areas of new development in the Valley (largely consolidated in the east Valley), Wawona, and El Portal, resulting in adverse impacts due to visual intrusions in the scenic landscape. However, impacts in these areas contribute directly to the improvement of the scenery within the Valley by removing facilities and restoring impacted areas.

The Wawona Campground Improvement project would have a local, long-term, beneficial impact on scenic resources due to restoration activities to improve the existing degraded campground, including activities to revegetate the riverbanks. Some aspects of the campground improvement project could have adverse effects on scenic resources due to new development in undeveloped areas, such as the proposal to construct an additional campground in Section 35.

These past and reasonably foreseeable future actions could have a net local, long-term, major, beneficial cumulative effect on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems, and reducing the number of vehicles. Scenic resources in the Wilderness segments would experience local, long-term, negligible, beneficial cumulative impacts due to the reduction of site-specific erosion and trampling and restoration of natural vegetation. In some developed areas in Wawona and El Portal, the cumulative projects would result in local, long-term, minor, adverse cumulative impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, beneficial impacts on scenic resources in designated Wilderness and Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, and reducing the number of vehicles traveling through the park. The adverse impacts to scenic resources in the Valley associated with Alternative 1 would be offset by restoration activities planned in the *Yosemite Valley Plan*. In some developed areas in Wawona and El Portal, Alternative 1 and the cumulative projects would result in local, long-term, adverse impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley, as prescribed in the *Yosemite Valley Plan*.

Conclusions

In the absence of a comprehensive planning effort to manage increased visitation and maintain and restore natural communities, Alternative 1 would have a local, long-term, adverse impact on scenic resources in developed and easily accessible areas.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, beneficial impacts on scenic resources in designated Wilderness and Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, and reducing the number of vehicles traveling through the park. The adverse impacts to scenic resources in the Valley associated with Alternative 1 would be offset by restoration activities planned in the *Yosemite Valley Plan*. In some developed areas in Wawona and El Portal, Alternative 1 and the cumulative projects would result in local, long-term, adverse impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley, as prescribed in the *Yosemite Valley Plan*.

Socioeconomics

Social Environment

Analysis

General Impacts. Under Alternative 1, employee housing and commutes would not substantially change from existing conditions in Yosemite Valley, El Portal, and Wawona. The often cramped, crowded, and communal housing conditions for seasonal employees and lack of sufficient housing types for employees with families could continue in Yosemite Valley and Wawona.

Although Yosemite National Park and the El Portal area provide outstanding outdoor recreational opportunities, local communities lack recreation facilities for area residents. For example, Yosemite Valley does not have a community center or other such facility to provide a centralized meeting area for Valley residents. El Portal lacks pedestrian access between Rancheria Flat housing, the Trailer Village, the El Portal Village Center, and local schools. El Portal Road, Foresta Road, and Highway 140 provide the only travel corridors in El Portal, neither of which provides sidewalks or sufficient road berms for safe pedestrian travel. El Portal and Wawona also have limited community amenities. Under Alternative 1, the lack of sufficient community recreational facilities would continue, and the crowded and communal housing conditions could worsen. The above-described conditions would constitute a local, long-term adverse environmental impact associated with the No Action Alternative on the social environments of the Valley, El Portal, and Wawona.

Summary of Alternative 1 Impacts. Under Alternative 1, the lack of sufficient community recreational facilities would continue, and the crowded and communal housing conditions could worsen resulting in a local, long-term adverse environmental impact on the social environments of the Valley, El Portal, and Wawona.

Cumulative Impacts. Cumulative effects on the social environment discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to this environmental discipline.

Past Actions. A substantial number of concession beds were damaged by the 1997 flood and were subsequently removed. The majority of the removed concession beds were replaced with temporary beds for concession employees, although not all of the beds were replaced, which resulted in a net loss of concessioner housing in Yosemite Valley. The loss of housing and the replacement of permanent housing with temporary housing has had a local, long-term, adverse effect on the social environment of Yosemite Valley.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the social environment include:

- Yosemite Area Regional Transportation System (YARTS)
- Merced River Canyon Trail Acquisition (BLM)

Implementation of YARTS would provide additional transportation options for employees and community residents. YARTS could somewhat improve the commuting conditions of employees by providing regional transportation alternatives for those employees resulting in a regional, long-term, beneficial impact on employee commutes.

The Bureau of Land Management's Merced River Canyon Trail Acquisition would allow for the development of a recreational trail west of the El Portal Administrative Site. This project would somewhat improve community amenities in El Portal, resulting in a local, long-term, beneficial impact on the social environment of El Portal.

A reasonably foreseeable future project that could have an adverse effect on the social environment includes:

- The Yosemite View parcel land exchange, El Portal (NPS)

The Yosemite View parcel land exchange would somewhat reduce the amount of open space available to the community of El Portal, although the proposed motel development would incorporate a public trail system and limited nature/river interpretive areas. This project would result in a local, long-term, adverse impact to the social environment of El Portal. This would result from the strain on limited community amenities in El Portal, loss of open space, and the opportunity cost of removing the National Park Service Parkline land from consideration for other community needs.

A reasonably foreseeable future project that could have a mixed effect on the social environment includes:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would remove substantial amounts of employee housing from Yosemite Valley, and would construct new employee housing in El Portal and Wawona, among other locations. Redesigned housing in Yosemite Valley and new housing in El Portal and Wawona would substantially improve the quality of housing in these communities. The social environment in Yosemite Valley would experience local, long-term, beneficial effects associated with reduced crowding, more secure housing conditions, and increased privacy. The social environment of the workforce would experience local, long-term, adverse effects associated with increases in commuting time, change of housing locale, and a decrease in social amenities near housing sites. For the Yosemite Valley workforce, the adverse effects may be so severe that they would no longer be willing to work in the Valley and may leave the area. The social environment in El Portal and Wawona would experience local, long-term, adverse effects due to substantial increases in housing in these communities, although it is expected that the projected population growth would be gradual. Even though the *Yosemite Valley Plan* calls for the placement of

community amenities in El Portal, there could be substantial strains on the limited community amenities of El Portal as employees transition from Yosemite Valley.

The cumulative projects would have a regional, long-term, negligible, beneficial impact on employee commuting conditions due to the provision of regional transportation alternatives. The cumulative projects would have a local, long-term, moderate to major, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal). The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, beneficial impact by providing additional transportation options for employees and community residents. Alternative 1 and the cumulative projects would have a local, long-term, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal).

Conclusions. Under Alternative 1, the lack of sufficient community recreational facilities would continue, and the crowded and communal housing conditions could worsen resulting in a local, long-term adverse environmental impact on the social environments of Yosemite Valley, El Portal, and Wawona.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, beneficial impact by providing additional transportation options for employees and community residents. Alternative 1 and the cumulative projects would have a local, long-term, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time to Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal).

Visitor Populations

Analysis

General Impacts. Under Alternative 1, there would be no changes to visitor accommodations in the park. The number of lodging and camping facilities would be maintained at current levels. Camping and lodging facilities damaged by and/or removed after the 1997 flood would not be repaired or rebuilt.

Overall, park visitation would increase over existing levels, although the increase in park visitation by 2020 is not quantifiable. It is expected that increases in visitation would occur primarily during the current nonpeak periods (e.g., during months on either side of peak summer months—known as the shoulder season—and on weekdays during peak summer months).

Increased visitation would likely be day users (local overnigheters and day visitors) rather than park overnigheters, because in-park accommodations would remain at current levels and are generally filled to capacity during the peak season, and because all-weather lodging facilities operate near capacity year-round. Increases in day use would be limited by the continued implementation of the Restricted Access Plan, as discussed in the transportation section. Since the number of in-park accommodations would not increase or decrease under Alternative 1, there would be no impact on park overnigheters associated with increased or decreased opportunities to lodge or camp in the park.

In addition, it is expected that there would be no change in Yosemite visitor spending behavior. No changes are proposed that would alter the types of goods and services available to park visitors. Furthermore, Alternative 1 would not involve any actions that would change the profile of the “typical” Yosemite visitor, such as excluding or attracting different visitor groups. Visitor spending behavior, as described in the 1998 YARTS survey, would be expected to be representative of future Yosemite visitor spending behavior.

Under this alternative, Yosemite visitor spending would increase proportionately to the increase in visitation by 2020. Impacts to the economy associated with changes in visitor spending are discussed below under the heading “Regional Economy.”

Summary of Alternative 1 Impacts. Annual park visitation would increase over existing levels (primarily day users), and visitor spending would increase proportionately to the increase in visitation. There would be no impact on park overnigheters, since the number of in-park accommodations would not change under Alternative 1.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the visitor populations.

Past Actions. Upper and Lower River Campgrounds were damaged by the 1997 flood and have been closed to visitors. In addition, a substantial number of units at the Yosemite Lodge were damaged during the flood and have been removed. Closure of these campgrounds and lodging units reduced the number of in-park accommodations available, further exacerbating unmet

demand for accommodations. Closure of these facilities has had a local, long-term, adverse effect on park overnighers, due to the clearly detectable reduction in park accommodations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have a net adverse effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the visitor population include:

- Yosemite Area Regional Transportation System (YARTS)
- Wawona Campground Improvement (NPS)

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley if the Restricted Access Plan were implemented. It is anticipated that the regional, long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

The Wawona Campground Improvement project would improve the existing camping facilities at Wawona Campground and would construct additional campground facilities in Section 35 in Wawona. This project would have a local, long-term, beneficial impact on the visitor population by increasing the number of campsites in the park.

A reasonably foreseeable future project that could have a net adverse effect on the visitor population includes:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would substantially reduce the number of lodging facilities and nominally reduce the number of campsites in Yosemite Valley, resulting in a local, long-term, adverse impact on the visitor population due to decreased opportunities to lodge and camp in the Valley. Since the number of less expensive lodging and camping units would be reduced under the *Yosemite Valley Plan*, the number of low-income visitors able to stay overnight in the Valley may be reduced. This could represent a local, long-term, adverse impact on the low-income visitor population.

The cumulative projects would have a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Given the reduction in the number of lodging and camping units, these cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population due to decreased opportunities to lodge and camp in the Valley.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 1 and the cumulative projects would have a local, long-term, adverse impact on the

visitor population due to the potential overall reduction in the number of lodging and camping units in the park.

Conclusions. Annual park visitation would increase over existing levels (primarily day users), and visitor spending would increase proportionately to the increase in visitation. There would be no impact on park overnights, since the number of in-park accommodations would not change under Alternative 1.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 1 and the cumulative projects would have a local, long-term, adverse impact on the visitor population due to the potential overall reduction in the number of lodging and camping units in the park.

Regional Economy

Analysis

General Impacts. As stated above under the heading “Visitor Populations,” the increase in park visitation would likely be day visitors, due to limitations on park accommodations. Demand for lodging during the shoulder season would more likely be accommodated by the gateway communities, which have more capacity during the peak midweek and shoulder season than does the park. In the short term, the increased demand for overnight accommodations may not be accommodated in the region, resulting in some visitors being displaced to or replaced by day visitors. In the long term, it is expected that the lodging market in the gateway areas would respond to visitor demand and sufficient lodging would become available.

The increase in park visitation (primarily during the current nonpeak periods) and proportionate increase in visitor spending would have a long-term, beneficial effect on the regional economy. The peak visitation season would be extended into the shoulder season, somewhat reducing the “seasonality” of the visitor-serving businesses in the affected region by providing a longer revenue-generating period, and additional income and employment for the region. Although the magnitude of the increase in visitation and visitor spending is not known, the effect on the regional economy would not be substantial due to the relatively modest increase in visitor spending in the region (given the continued implementation of the Restricted Access Plan) as compared to the size of the regional tourist economies.

Summary of Alternative 1 Impacts. Under Alternative 1, the increase in park visitation (primarily during the current nonpeak periods) and proportionate increase in visitor spending would have a long-term, beneficial effect on the regional economy.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the regional economy.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the regional economy are listed below.

- The *Yosemite Valley Plan* (NPS)
- Yosemite Area Regional Transportation System (YARTS)
- Development-related projects, such as Yosemite West Rezoning Application (NPS), Hazel Green Ranch (Mariposa Co.), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort, June Lake (Mono Co.), Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge Expansion (Tuolumne Co.), Hardin Flat Lodging and Conference Facilities (Tuolumne Co.), Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.), Silver Tip Resort Village Project (Mariposa Co.)

The *Yosemite Valley Plan* would have a short-term, beneficial impact on the regional economy resulting from project construction spending and employment associated with implementation of the alternative. In the long-term, although the *Yosemite Valley Plan* would result in a decrease in in-park accommodations (and its associated visitor spending), the overall economic impacts of changes from visitor spending and operations spending to the regional economy would be long-term and beneficial. It is anticipated that Yosemite visitor spending associated adverse impacts to the regional economy would be more than offset by increased regional output and employment from expanded National Park Service in-park operations and the proposed new park visitor transit system.

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley if the Restricted Access Plan were implemented. It is anticipated that the long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

Several new lodging facilities are planned in the affected region, including tent cabins and hard-sided cabins at Hazel Green Ranch outside the park near the Big Oak Flat Entrance Station (Mariposa Co.), a hotel complex as part of the Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort in June Lake, Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge expansion near Camp Mather, a hotel in Hardin Flat, a motel and restaurant in Second Garrotte Basin (Tuolumne Co.), and the Silver Tip Resort Village Project in Fish Camp. Development of these facilities would expand the overnight lodging capacity of the gateway region. By providing local construction spending and employment during development, increasing lodging revenues and transient occupancy taxes, and providing sources of income and employment for area residents, these facilities would have a long-term, beneficial effect on the regional economy. The development of these facilities would increase demand for government services, including police, fire, and other services; it would be expected, however, that local government taxes assessed for these facilities would offset the incremental costs associated with providing such services.

These cumulative projects would have a short-term, minor, beneficial effect on the regional economy due to project construction spending and employment associated with implementation of the projects. The cumulative projects would have a long-term, minor, beneficial effect on the regional economy due to increased regional output and employment from expanded National Park

Service in-park operations, increased access for day visitors to the park, and increased lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, beneficial impact on the regional economy due to project construction spending and employment associated with development of the cumulative projects. Alternative 1 and the cumulative projects would result in a long-term, beneficial impact on the regional economy due to an increase in park visitation (primarily during the current non-peak periods), increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Conclusions. The increase in park visitation (primarily during the current nonpeak periods) and proportionate increase in visitor spending would have a long-term, beneficial effect on the regional economy.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, beneficial impact on the regional economy due to project construction spending and employment associated with development of the cumulative projects. Alternative 1 and the cumulative projects would result in a long-term, beneficial impact on the regional economy due to an increase in park visitation (primarily during the current non-peak periods), increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Concessioner

Analysis

General Impacts. Under Alternative 1, there would be no change to the concession facilities in the park. Concession facilities would be maintained at current levels, and facilities removed after the 1997 flood would not be rebuilt. The peak visitation season would be extended into the shoulder season, somewhat reducing the “seasonality” of concession businesses by providing a longer revenue-generating period.

The increase in park visitation and proportionate increase in visitor spending under Alternative 1 would have a local, long-term, beneficial effect on primary park concessioner revenues. The increase in concession revenues would largely be associated with increases in visitor spending on meals, services, and novelties. Lodging revenue increases would be less prevalent, since concession lodging facilities are currently generally operating close to capacity during the peak and shoulder seasons, and no new concession lodging facilities are proposed under this alternative. This would be a local impact, since the concession operations are generally confined to the park.

Summary of Alternative 1 Impacts. Alternative 1 would have a local, long-term, beneficial effect on concessioner revenues due to a reduction in the “seasonality” of concession operations and increased visitor spending.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to concessioner operations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have an adverse effect on the concessioner are listed below.

- The *Yosemite Valley Plan* (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Valley Plan* proposes changes to park facilities that are expected to have a local, long-term, adverse impact on the primary park concessioner. The adverse impact is associated with locating new employee housing outside of the Valley, and a decrease in annual concessioner profits (although the profit loss could be offset and result in the concessioner’s net profit being unaffected).

The update to the *Yosemite Wilderness Management Plan* (NPS) could restrict visitor use of the Merced Lake High Sierra Camp, resulting in closure of the camp to overnight lodging and a loss of revenues to the concessioner associated with providing overnight lodging services. The cumulative effect of the potential closure of Merced Lake High Sierra Camp would be a local, long-term, adverse impact on primary park concessioner revenues.

The cumulative projects would have a local, long-term, minor, adverse impact on the primary park concessioner associated with locating new employee housing outside of the Valley, a decrease annual concessioner profits (although this could be offset and result in the concessioner’s net profit being unaffected), and possible closure of Merced Lake High Sierra Camp.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on the primary park concessioner associated with locating new employee housing outside of the Valley, a decrease in annual concessioner profits (although this could be offset and result in the concessioner’s net profit being unaffected), and possible closure of Merced Lake High Sierra Camp. The adverse impact associated with the cumulative projects would be somewhat offset by the beneficial impact associated with reducing the “seasonality” of concession operations and increased visitor spending forecast under Alternative 1.

Conclusions. Alternative 1 would have a local, long-term, beneficial effect on concessioner revenues due to a reduction in the “seasonality” of concession operations and increased visitor spending.

Alternative 1 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, adverse impact on the primary park concessioner associated with locating new employee housing outside of the Valley, a decrease in annual concessioner profits

(although this could be offset and result in the primary park concessioner's net profit being unaffected), and possible closure of Merced Lake High Sierra Camp. The adverse impact associated with the cumulative projects would be somewhat offset by the beneficial impact associated with reducing the "seasonality" of concession operations and increased visitor spending forecast under Alternative 1.

Park Operations and Facilities

Analysis

General Impacts. Park operations would continue at current levels of staffing, housing, management, and logistical maneuvering. Traffic congestion identified in the 1980 *General Management Plan* would not be addressed, and operational functions identified in that plan as being moved to El Portal would remain within Yosemite Valley. Park operations would continue to be primarily dispersed between Yosemite Valley and El Portal. Yosemite Valley would continue to serve as a base of parkwide operations for some functions, including administrative offices, concessions management, some visitor protection, interpretation operations, and the National Park Service stable. However, Resources Management offices, which were damaged during the 1997 flood, would be relocated to El Portal. The National Park Service Administration (headquarters) Building in Yosemite Village would continue to serve an organizational function in the midst of an interpretive complex. This situation complicates park operations in various ways and would continue over time. Dispersed staff requires additional trips to coordinate meetings, primarily between Yosemite Valley and El Portal, which decreases staff productivity (e.g., travel time to and from work areas) and increases road wear on vehicles.

Park operations staffing levels have declined in recent years and, in many cases, are below levels considered necessary. However, personnel will continue to be assigned to essential park operational responsibilities to the extent possible. If current staffing levels remain the same in future years, this would represent a long-term, adverse impact to future park operations.

The following discussion provides an overview of the types of impacts to park operations and facilities that could occur within each segment of the Merced River corridor from implementation of Alternative 1.

Impacts in Wilderness. The wilderness reaches of the Merced River would continue to be managed based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Alternative 1 is not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork). Consequently, Alternative 1 would have no impact on park operations and facilities within wilderness segments of the main stem and South Fork of the Merced River.

Impacts in Yosemite Valley. Camping, lodging, parking, and other facilities are assumed to remain as they are under existing conditions. Operational improvements (e.g., hiring additional staff) could be made under Alternative 1, but no such improvements are assumed for this analysis. Some lodging facilities at Yosemite Lodge that were damaged by the 1997 flood were repaired and would remain. Other camping and lodging facilities damaged by, and/or removed after, the 1997 flood, however, would not be repaired or rebuilt. Over the long term, old or failing

facilities would increase demand on park operations, especially maintenance personnel. It is anticipated that visitor demand and overall use of the park would increase. Increased visitor use could increase adverse impacts on facilities (e.g., wear on roads and trails) and natural areas (e.g., trampling, soil compaction) and increase demand for maintenance, protection, interpretation, and resource (restoration) services over the long term. Parking demand likely would exceed parking availability, which could trigger the need to implement the Restricted Access Plan on an increasing number of days during the peak season. Visitors would continue to be able to drive their private vehicles, but many would not be able to find parking spaces near their destinations and would need to park in roadside spaces or spend more time searching for parking. Visitors unable to locate legal parking could circle the Valley in search of a place to park, which could increase driver aggravation and lead to increases in vehicle accidents (increasing demand on protection services). Visitors unable to locate a parking space could also decide to park in unauthorized/improper areas, which could degrade natural areas (e.g., directly as a result of parking on natural vegetation, indirectly by the creation of informal trails from unauthorized/improper parking areas to park destinations) and increase demand on protection (enforcement), maintenance, and resource (restoration) services. The effects on park operations and facilities would be directly related to the change in visitation and could result in a long-term, adverse effect.

Parking for private automobiles and commercial tour buses would remain dispersed at sites and turnouts throughout the Merced River corridor. This situation complicates park operations in various ways and would continue over time. Patrol of facilities and visitor use of the facilities and adjacent areas would continue consistent with existing conditions. These operations could be aggravated and become worse over time as visitation increases. Although the Restricted Access Plan could continue to be implemented to manage visitor access during periods of high visitation when there were more vehicles than available parking spaces, implementation of the Restricted Access Plan as visitation increases would create its own demand on park operations, primarily protection personnel. It is expected that increases in visitation levels would occur primarily during the current nonpeak periods (e.g., during months on either side of peak summer months, and on weekdays during peak summer months) and could result in the need for additional year-round staff (e.g., protection, maintenance, interpretation). Overall, the effects on park operations and facilities created by dispersed parking would be directly related to the increase in visitation and could result in a long-term, adverse effect.

Overall, increased visitation to Yosemite Valley would increase demand on protection (enforcement), maintenance, and resource (restoration) services. The effects on park operations and facilities would be directly related to the change in visitation and could result in a long-term, adverse impact.

Impacts in Merced River Gorge and El Portal. Old or failing facilities (e.g., El Portal Road) would continue in their current condition. Over the long term, maintenance of these facilities would likely increase and become more complicated, creating an increased demand on park operations, especially maintenance personnel. Increased maintenance of major facilities could also result in temporary facility closure and increase demand for protection services personnel to direct visitors to other areas (e.g., temporary road closures could increase detours and the need for protection services to enforce detours).

Increased visitation to Yosemite Valley could have adverse effects on park operations and facilities of the gorge and El Portal, if implementation of the Restricted Access Plan resulted in increased visitation to these areas by people displaced out of the Valley. Increased use of the gorge and El Portal could increase demand on maintenance, protection, resource, and interpretation staff. If use of the gorge and El Portal increased, it is reasonable to assume that demand for parking, interpretation, and recreational opportunities would increase proportionally. As the demand for parking increases, use of park facilities as well as unauthorized/improper areas would increase. Increased use of either would increase maintenance and protection activities. Increased parking in unauthorized/improper areas also could decrease visitor safety (e.g., parking at unauthorized locations along El Portal Road could increase vehicle accidents and vehicle-visitor conflicts) and degrade natural areas (e.g., directly as a result of parking on natural vegetation, indirectly by the creation of informal trails from unauthorized/improper parking areas to park destinations). These in turn would increase demand on protection (enforcement), maintenance, and resource (restoration) services. The effects on park operations and facilities would be directly related to the change in visitation within the gorge and El Portal and could result in long-term, adverse effects. These impacts would be concentrated in areas of relatively easy access (e.g., along the El Portal Road, in El Portal, and at Cascades). A majority of the gorge is relatively inaccessible, and visitor use is unlikely to increase. Consequently, there would be no impact on park operations and facilities at these locations.

Impacts in Wawona. Effects on park operations and facilities in Wawona would be similar to those described for the gorge and El Portal. Old or failing facilities (e.g., the South Fork Merced River Bridge in Wawona) would continue in their current condition. Over the long term, maintenance of these facilities would likely increase and become more complicated, creating an increased demand on park operations, especially maintenance personnel. Increased maintenance of facilities, such as the South Fork Merced River Bridge, could also result in temporary facility closure and increase demand for protection services personnel to direct visitors to other areas (e.g., temporary bridge closure could increase detours and the need for protection services to enforce detours).

Increased visitation to Yosemite Valley could have adverse effects on park operations and facilities of Wawona if implementation of the Restricted Access Plan resulted in increased visitation to this area by people displaced out of the Valley. Increased use of Wawona could increase demand on maintenance, protection, resource, and interpretation staff similar to that described for the gorge and El Portal. The effects on park operations and facilities would be directly related to the change in visitation within Wawona and could result in long-term, adverse effects.

Summary Alternative 1 Impacts. Long-term, adverse impacts to park operations and facilities as a result of Alternative 1 would be related to dispersed park operations, staffing levels, old or failing facilities, and increased visitation. Park operations would continue to be dispersed between Yosemite Valley and El Portal. Dispersed staff requires additional trips to coordinate meetings, primarily between Yosemite Valley and El Portal, which decreases staff productivity (e.g., travel time to and from work areas) and increases road wear and demand on all personnel. Staffing levels throughout the park have declined in recent years and, in many cases, are below levels considered necessary. If current staffing levels remain the same in future years, this would

represent a long-term, adverse impact to future park operations as staff were unable to meet the demand for park operations services and facilities. Old or failing facilities would continue in their current condition, and over the long term, could require increased maintenance. It is anticipated that visitor demand and overall use of the park would increase. Increased visitor use could increase adverse impacts on facilities (e.g., wear on roads and trails) and natural areas (e.g., trampling, soil compaction) and increase demand for maintenance, protection, interpretation, and resource (restoration) services over the long term. In total, Alternative 1 could have long-term, adverse impacts on park operations and facilities.

Cumulative Impacts

Cumulative effects on park operations and facilities discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the immediate Yosemite region in combination with potential effects of this alternative. The extent to which past, present, or reasonably foreseeable projects could have a cumulative effect, when combined with other actions that could result under present National Park Service management strategies, is determined largely by whether such projects would affect demand for park operations services and facilities. For example, effects of projects that change the number of vehicles traveling through the park could combine with effects of the *Merced River Plan* to either increase or decrease the need for maintenance activities on roads and bridges. Similarly, projects that affect demand for other park operations services and facilities could also have a cumulative effect. These services include maintenance of utility systems, provision of interpretation programs, visitor protection, and resource management.

Past Actions. Park operations and facilities have been affected by numerous past National Park Service management decisions made since the inception of the park. Primary among those, when considered in relation to the potential effects of the *Merced River Plan*, include relocating the National Park Service maintenance shops and warehouse to El Portal (mostly adverse), removal of the hydroelectric generating plant (mostly adverse), professionalization of law enforcement staff (mostly adverse), rehabilitation of the water and electric distribution systems (mostly beneficial), improved communication systems (cell phones and radios, mostly beneficial), relocating the National Park Service wastewater treatment facility from Yosemite Valley to El Portal (mostly beneficial), and implementation of the prescribed fire program (adverse and beneficial). Overall, there is no net adverse or beneficial effect of these past actions on park operations and facilities.

Present Actions. Present actions that affect park operations and facilities include planning related to the *Yosemite Valley Plan* (NPS) and the El Portal Road Reconstruction Project (NPS). The *Yosemite Valley Plan* has substantially increased demand on resource, facility, and planning staff. The El Portal Road Reconstruction Project (NPS) is currently underway and affects park operations and facilities because the reconstruction is placing some increased demand on park operations staff.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net

beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Projects that could have a cumulative, beneficial effect on park operations and facilities include those that could reduce the number of visitors entering the park, reduce the number or amount of facilities within the park, or reduce long-term maintenance activities. Examples of these types of projects include:

- Transportation projects including the Yosemite Valley Shuttle Bus Stop Improvements (NPS), The South Fork Merced River Bridges Replacement (NPS), and Evergreen Road Improvements (multi-agency, see Appendix G)
- Several Yosemite utility projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line, Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, and Hodgdon Meadows Water and Wastewater Treatment Improvements, and O'Shaughnessy Compound Water System Improvements (NPS)
- Planning efforts, including the South Entrance/Mariposa Grove Site Planning (NPS), update to the *Yosemite Fire Management Plan* (NPS), update to the *Yosemite Wilderness Management Plan* (NPS), and *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

Although each of the aforementioned projects could have short-term, adverse effects associated with planning, construction, replacement, or rehabilitation, the general goal of each of these projects is to reduce long-term maintenance. Therefore, these projects could have a long-term, beneficial, cumulative impact on park operations and facilities.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on park operations and facilities include:

- The Yosemite Area Regional Transportation System (YARTS), which has a goal of increasing transportation options and reducing reliance on automobiles in the area
- Planned rehabilitation of Tamarack Campground, Yosemite Creek Campground, Hodgdon Meadow Campground, Wawona Campground Improvement, and Bridalveil Horse Camp (NPS)
- Development-related projects such as Yosemite West Rezoning Application (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI), Tuolumne Meadows Development Concept Plan (NPS), Resource Management Building, Expansion of Mariposa County Transit System, and University of California, Merced Campus (Merced Co.)

Cumulative effects of the campground rehabilitation projects could be mixed, combining both adverse and beneficial effects. For example, the rehabilitation of Tamarack Campground would have a short-term, adverse effect on park operations and facilities during planning and construction. Post-construction, maintenance would be reduced compared to existing conditions, resulting in a long-term, beneficial impact on park operations and facilities.

Reasonably foreseeable projects that could have an adverse effect on park operations and facilities include:

- The *Yosemite Valley Plan* (NPS), which would implement the goals of the 1980 *General Management Plan*
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several regional lodging projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.), Tioga Inn, Lee Vining (Mono Co.); Hazel Green Ranch (Mariposa Co.), and Evergreen Lodge Expansion (multi-agency, see Appendix G)
- Merced River Canyon Trail Acquisition (BLM)
- Sierra Nevada Framework for Conservation and Collaboration (USFS)

Each of these projects would increase demand for services and facilities and add to the cumulative, adverse impact on park operations and facilities. For example, the *Yosemite Valley Plan* could substantially increase demand on park operations and facilities in the short term during planning, repair, rehabilitation, construction/demolition, and replacement of facilities (e.g., removal of the road through Stoneman Meadow, construction of new campsites, restoration of large areas of Yosemite Valley to natural conditions).

These past, present, and reasonably foreseeable future actions could have adverse, cumulative effects on park operations and facilities because of the increased demand on park operations services and facilities over both the short and long term. The combined effects of Alternative 1 with other cumulative projects would result in a long-term, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Conclusions

Long-term, adverse impacts to park operations and facilities as a result of Alternative 1 would be related to dispersed park operations, insufficient staffing levels, old or failing facilities, and increased visitation. Park operations would continue to be dispersed between Yosemite Valley and El Portal. Dispersed staff requires additional trips to coordinate meetings, primarily between Yosemite Valley and El Portal, which decreases staff productivity (e.g., travel time to and from work areas) and increases road wear on vehicles and demand on all personnel. Staffing levels throughout the park have declined in recent years and, in many cases, are below those believed necessary by knowledgeable staff. If current staffing levels remain the same in future years, this would represent a long-term, adverse impact to future park operations as staff were unable to meet the demand for park operations services and facilities. Old or failing facilities would continue in their current condition and, over the long term, could require increased maintenance. It is anticipated that visitor demand and overall use of the park would increase. Increased visitor use could increase adverse impacts on facilities (e.g., wear on roads and trails) and natural areas (e.g., trampling, soil compaction) and increase demand for maintenance, protection, interpretation, and resource (restoration) services over the long term. In total, Alternative 1 could have long-term, adverse impacts on park operations and facilities.

The combined effects of Alternative 1 with other cumulative projects would result in a long-term, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Unavoidable Adverse Impacts

Under Alternative 1, human-made obstructions would continue to obstruct the free-flowing characteristic of the Merced River and subsequently alter stream processes that define channel characteristics such as channel shape and sinuosity and the ability of the river to naturally discharge and dissipate channel-forming flows or flood flows. The streamflow would continue to be permanently altered and would adversely affect the Outstandingly Remarkable Values associated with the free-flowing nature of the river. This impact is expected to worsen over time, resulting in an unavoidable adverse effect.

Irreversible and Irretrievable Commitments of Resources

Alternative 1 would not result in the temporary or permanent loss of any resources.

Relationship of Short-Term Uses of Man's Environment and Long-Term Productivity

Since no actions are associated with Alternative 1, no short-term benefits would occur. However, the ongoing impacts to the free-flowing condition of the river, streambank erosion, and impacts to biological communities associated with the river would continue. In addition, obstructions in the river corridor would continue to be present. Therefore, no changes to the free-flowing condition of the river would occur.

Alternative 2: Visitor Use/Resource Protection

Alternative 2 protects and enhances Outstandingly Remarkable Values and preserves the free-flowing condition of the river while providing for a range of visitor experiences and access to the river corridor.

For the duration of the *Merced River Plan*, Alternative 2 would provide a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework. Compared to Alternative 1, which has no such management framework, this is considered to be a minor, beneficial impact for visitor experience, natural resources, cultural resources, social resources, and associated Outstandingly Remarkable Values.

Boundaries. The following analysis applies a quarter-mile boundary, except at the El Portal Administrative Site where the boundary is defined by the 100-year floodplain (see figures II-11 through II-14 in Chapter II, Alternatives). Changes to the boundaries proposed under this alternative would expand the area for which management zoning is applied compared to Alternative 1. Changes to the boundaries in and of themselves would have no effect on visitor experience, natural, cultural, and social resources, and Outstandingly Remarkable Values. Rather, it is the application of management zoning that has the potential to affect visitor experience, natural, cultural, and social resources, and Outstandingly Remarkable Values. The change to the boundaries is not discussed further in this alternative.

Classifications. Changes to the classifications (shown in figure II-3) proposed under this alternative would have no effect on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values. Changes to classifications proposed under Alternative 2 (east Yosemite Valley and Wawona are reclassified from scenic to recreational) are technical corrections made when the boundary was extended to the full quarter-mile and reflect existing access to the Merced River, shoreline development, and watershed development within these segments. Change in the classifications would not alter management or protection of the east Yosemite Valley or Wawona river segments. The change to the classifications is not discussed further in this alternative.

Outstandingly Remarkable Values. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised in this alternative based on the application of new scientific information, changed conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act (refer to Appendix E for a history of the Outstandingly Remarkable Values). Specifically, those resources that are not directly related to the Merced River (e.g., western juniper, air quality, skiing, rock climbing) or are not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these

resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., 1916 Organic Act, Federal Endangered Species Act, Clean Water Act). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*. The change in Outstandingly Remarkable Values is discussed as appropriate under specific resource topics addressed for this alternative.

Section 7 Determination Process. The application of the consistent Section 7 determination process for water resources projects would provide a negligible, beneficial impact on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values compared to Alternative 1 because management direction for future water resources would be provided. Application of the consistent Section 7 determination process is discussed as appropriate under specific resource topics addressed for this alternative.

Management Zoning. Management zoning could have long-term, beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values within the Merced River corridor. This management element would limit the type of new facilities that could be built, would encourage the removal of inconsistent facilities, and would allow new development or redevelopment as appropriate. Management zoning is discussed as appropriate under specific resource topics addressed for this alternative.

River Protection Overlay. The River Protection Overlay could have long-term, beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values within the Merced River corridor. This management element would limit the type of new facilities that could be built, would minimize adverse effects of new facilities (e.g., bridges, roads) to Outstandingly Remarkable Values and the free-flowing condition of the Merced River, and would encourage the removal of inconsistent facilities. The River Protection Overlay is discussed as appropriate under specific resource topics addressed for this alternative.

Visitor Experience and Resource Protection. Implementation of the VERP framework would have beneficial and adverse impacts on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values. The VERP framework protects both park resources and visitor experience, with particular focus on the Outstandingly Remarkable Values, from impacts associated with visitor use, and helps managers address issues associated with visitor use. The VERP framework is discussed as appropriate under specific resource topics addressed for this alternative.

Natural Resources

Geology, Geohazards, and Soils

Analysis

General Impacts. Geologic resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., cirques, paternoster lakes) or not unique to the region or nation have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*), as well as by federal law (the Organic Act, Wilderness Act). Geologic-process Outstandingly Remarkable Values include the mature, meandering nature of the Merced River through Yosemite Valley, a classic V-shaped river through the gorge, evidence of ice-age glaciation (U-shaped and hanging valleys), and extraordinary granite features (i.e., exfoliation domes). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Rockfall Hazards. Under application of management zones for Alternative 2, facilities could be relocated from ecologically vulnerable areas along the Merced River to areas susceptible to rockfall risks. Most rockfalls are associated with triggering events such as earthquakes, climatic changes such as rainfall events, or gradual stress release and exfoliation of the granite. Relocation of facilities into rockfall-susceptible areas would be expected to occur primarily in Developed zones (3A-3C) such as Yosemite Valley, the Merced River gorge, and possibly along the South Fork in the Wawona area. For instance, if a Yosemite Valley transit center and parking facility were constructed at Taft Toe (zoned 3C), it would lie partially within the base of talus and rockfall shadow zone and could expose the structure and visitors to risk of rockfalls and rock avalanches. Rockfall hazard potential in the upper wilderness reaches of the Merced River and South Fork, zoned as Wilderness (Zone 1), would not change from Alternative 1, and the potential for impacts to visitors and facilities would be lower than would be expected in areas zoned for more intense visitor use. Under Alternative 2, the National Park Service could retain and revise current management guidelines pertaining to geologic hazards (e.g., those policies implemented to protect visitors and reduce damage to park infrastructure). For example, if a Taft Toe transit center and parking facility were developed, the National Park Service would conduct appropriate studies to determine proximity of the facility to the talus zone and the stability of the adjacent rock cliffs. Considering the unpredictable and unavoidable nature of rockfalls and the potential for them to occur throughout Yosemite National Park, Alternative 2 would result in a long-term, moderate, adverse impact on public safety from hazards associated with rockfall events.

Seismic Hazards. Historically, seismic events in the Sierra Nevada and Yosemite National Park have been relatively infrequent; however, when they do occur, the resultant groundshaking is capable of triggering rockfalls and producing ground accelerations that are higher than some older, less structurally stable buildings can tolerate. Typically, the seismic risks of injury to visitors and damage to facilities would occur in the developed portions of Yosemite National Park, such as Yosemite Valley, El Portal, and Wawona. In these areas, buildings and other facilities placed within saturated alluvial soil (for instance, within the floodplain of the Merced River) could also be susceptible to secondary hazards from seismic groundshaking, including liquefaction and seismically induced settlement. For example, within Yosemite Valley, any potential facility development at Camp 6 (zone 3C) would require construction within alluvial sediments that could be susceptible to effects of unstable soils (such as settlement) and, in the event of significant groundshaking, the effects of liquefaction.

In undeveloped areas where visitor use is relatively low (for instance, in the upper wilderness reaches of the Merced River and the South Fork), groundshaking effects from seismic events would result in a lower potential for injury and structural damage. Under Alternative 2, the National Park Service could retain and revise current management guidelines pertaining to geologic hazards and resources, such as those policies implemented to protect visitors and reduce damage to park infrastructure. If relocation of existing facilities out of the floodplain were to occur, the National Park Service could conduct appropriate studies to determine proximity of the facility to the high-risk rockfall zones and the stability of the adjacent rock cliffs.

Under Alternative 2, as in Alternative 1, earthquakes in the Sierra Nevada region would continue to expose visitors in developed areas to potential injury in unstable buildings and to hazards from seismically triggered mass movement of rock slopes. Considering the potential for earthquake events in the Sierra Nevada, their unpredictable nature and unavoidable effects, Alternative 2 would have no impact on public safety related to seismic hazards compared to Alternative 1.

Impacts to Soils. Possible projects to accommodate increased visitor use in development zones could result in increased soil compaction, soil loss, and erosion. Compaction of native soils can occur through construction activity, concentrated visitor use in localized areas, or excessive vehicular traffic in unpaved areas. Construction excavation and replacement of native soils with engineered fills contribute to the reduction of local native soil. Excessive surface water runoff or loss of protective vegetation cover can cause erosion. Under management zoning for Alternative 2, it is possible that specific segments of the Merced River, especially those zoned as Developed (3A-3C), would be subjected to concentrated visitor use and could result in a long-term, moderate, adverse impact to soil resources. The effects of concentrated visitor use and additional facilities in zones supporting development would not intensify impacts to soil resources in the upper wilderness reaches and undeveloped areas adjacent to the main stem and south fork of the Merced River.

As a result of efforts to manage visitor use to protect natural and cultural resources within the Merced River corridor, including management zoning, the VERP framework, and the River Protection Overlay, soil erosion impacts due to visitor use and development projects would be less severe than under Alternative 1. The implementation of the VERP framework would have a long-term, moderate, beneficial impact on soil resources. For instance, if soil compaction were

selected as an indicator of desired conditions under the VERP framework, violations of the standard associated with this indicator would result in management action to manage or limit visitor use in a particular area. The management action could be to install signs or fences directing visitor use toward resilient areas and away from sensitive resources.

Under Alternative 2, the potential for increased facility development and concentrated visitor use could result in further compaction, soil removal, and erosion. Considering management efforts to protect natural and cultural resources through the VERP framework, the River Protection Overlay, and other site-specific geotechnical studies performed prior to the design and construction of any proposed facility, potential development under Alternative 2 would result in a long-term, minor, adverse impact on soil resources.

Summary of Alternative 2 Impacts. Compared to the Alternative 1, rockfall hazards under Alternative 2 would result in a long-term, moderate, adverse impact especially considering that under Alternative 2, facilities could be relocated to areas susceptible to hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable; therefore, when compared to Alternative 1, Alternative 2 would have no impact on public safety associated with seismic hazards. The addition of new facilities and concentrated visitor use under Alternative 2 could result in a long-term, moderate, adverse impact to soil resources. Conversely, efforts to protect natural and cultural resources through implementation of the VERP framework and the River Protection Overlay would have a long-term, moderate, beneficial impact on soil resources, especially in zones supporting additional development. The combined effects of adverse and beneficial impacts would result in a long-term, minor, adverse impact to soil resources.

Considering the collective risks associated with rockfalls, seismic hazards, and impacts to soil resources, and the implementation of potential future actions in accordance with the management zones of Alternative 2, would result in a long-term, moderate, adverse impact.

Cumulative Impacts

Cumulative impacts to geological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect geological resources within the river corridor or in the park vicinity.

Various reasonably foreseeable future actions could eventually result in construction of additional structures and facilities within zones susceptible to adverse impacts from earthquakes and rockfalls. These facilities would likely be located in developed areas, including Yosemite Valley, the El Portal Administrative Site, and Wawona.

Past Actions. Development projects intended to serve park visitors in Yosemite National Park have included hotels, visitor centers, campgrounds, and bridges with associated roads and parking lots. In addition, facilities required for park infrastructure support, including employee housing, utility facilities, maintenance yards, and supply storage areas, have been developed throughout the park. As popularity of Yosemite attracted a greater number of visitors, the number and magnitude of these projects increased to meet visitor demand. Past actions have resulted in

adverse impacts because projects were developed in areas that could be susceptible to damage from geohazards (rockfalls and seismic events), and facility development has contributed to the overall degradation of soil resources in the park.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects geology, geohazards, and soils. The reconstruction requires steepening the sheer rock slopes along the north side of the roadway, which increases the potential for rockfalls over the short term (by decreasing stability of the rock slopes). However, under the direction of engineers, design features for rock cuts along the El Portal Road (e.g., rock-bolting using 30-foot-long dowells) serve to increase the long-term stability of the rock slopes. These design features are also used to stabilize colluvial soil cuts, thereby reducing erosion. On the south side of the El Portal Road, shoulder widening requires construction of a fill slope that, in certain areas, encroaches into the Merced River. These effects are partially mitigated by implementation of standard design and construction-related best management practices. The project also involves rehabilitation of the sewerline, which reduces potential soil contamination, and the improvement of roadway drainage, thereby reducing erosion. The encroachment of the fill slope into the Merced River would cause minor obstruction to the free-flowing condition of the river. Overall, the El Portal Road Reconstruction (Segment D) Project would have a beneficial impact by reducing rockfall and soil erosion potential.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on geohazards and soil resources include:

- Several campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)

- Service, the Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS), both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- Transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., potential short-term construction erosion and soil loss), an objective of each of these projects is to restore and manage natural resources and reduce soil degradation. Therefore, these projects could have a net long-term, beneficial, cumulative impact on soil resources.

Reasonably foreseeable projects that could have both adverse and beneficial effects on regional geology, geohazards, and soils include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and White Wolf Water System Improvements (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Wawona Campground Improvement (NPS)
- Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)
- Several water improvement projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

Cumulative effects of the above-referenced projects could be a combination of adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term benefit on soil resources by increasing coordinated management of natural resources. However, short-term adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project above Cascades Diversion Dam). The current approach for the Segment D widening would require redesign. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., steepening of sheer rock

slopes, potentially leading to short-term, slope instability, and traffic circulation, safety, and noise impacts). The net effect of these projects is difficult to anticipate, but would likely result in an overall balance between beneficial and adverse effects. Reasonably foreseeable projects that could have an adverse effect on regional geology, increase the potential for impacts related to geologic hazards, and increase soil degradation include:

- Merced River Canyon Trail Acquisition (BLM)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Build Out of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)

Certain development projects, as listed above, could expose additional visitors to risk of rockfall and seismic hazards and result in increased degradation of soil resources. Examples of projects that would result in a cumulative increase in park development include the construction of South Entrance/Mariposa Grove Site Planning (NPS), the new Resources Management Building (NPS), Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.), and the El Portal Road Reconstruction Project (NPS).

Considering that hazards from geological processes such as rockfalls and earthquakes are unavoidable and unpredictable, park visitors would continue to be exposed to injury and damage from these hazards, thus resulting in a cumulative, long-term, adverse impact. The cumulative effect of future development actions would increase the overall depletion of soil resources by increasing soil removal, compaction, and erosion. Restoration projects may offset the rate of overall soil resource depletion, but not to the extent of providing a cumulative benefit. Future development projects would result in a cumulative, long-term, minor to moderate, adverse impact to soil resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

Rockfall hazards under Alternative 2 and the cumulative projects would result in a long-term, moderate, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, Alternative 2 could relocate facilities away from the floodplain and into areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury; therefore, Alternative 2 and the cumulative projects would have no impact in public safety associated with

seismic hazards. Impacts to soil resources under the cumulative projects could be reduced by Alternative 2 management zoning, VERP, and the River Protection Overlay, and thus would result in a long-term, minor, adverse impact. Overall, Alternative 2 and the cumulative projects would have a long-term, minor to moderate, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor to moderate, adverse impact on soil resources.

Conclusions

Compared to Alternative 1, rockfall hazards under Alternative 2 would result in a long-term, moderate, adverse impact, especially considering that under Alternative 2, facilities could be relocated to areas susceptible to seismic hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable; therefore, when compared to Alternative 1, Alternative 2 would have no impact on public safety associated with seismic hazards. The addition of new facilities and concentrated visitor use under Alternative 2 would result in a long-term, moderate, adverse impact on soil resources. Conversely, efforts to protect natural and cultural resources through implementation of the VERP framework and the River Protection Overlay would have a long-term, moderate, beneficial impact on soil resources, especially in zones supporting additional development. The combined effects of adverse and beneficial impacts would result in a long-term, minor, adverse impact to soil resources. Considered collectively the risks associated with rockfalls, seismic hazards, and impacts on soil resources, and the implementation of potential future actions in accordance with the management zones of Alternative 2 would result in a long-term, moderate, adverse impact.

Rockfall hazards under Alternative 2 and the cumulative projects would result in a long-term, moderate, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, Alternative 2 could relocate facilities away from the floodplain and into areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury; therefore, Alternative 2 and the cumulative projects would have no impact in public safety associated with seismic hazards. Impacts to soil resources under the cumulative projects could be reduced by Alternative 2 management zoning, VERP, and the River Protection Overlay, and thus would result in a long-term, minor, adverse impact. Overall, Alternative 2 and the cumulative projects would have a long-term, minor to moderate, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor to moderate, adverse impact on soil resources.

Hydrology, Floodplains, and Water Quality

Analysis

General Impacts. Hydrologic-process Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that do not accurately reflect site conditions (e.g., excellent water quality in Wawona and below Wawona) have been removed. Removal of these resources from the list of

Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Clean Water Act, 1916 Organic Act). Hydrologic-process Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now generally include excellent water quality, exceptionally steep gradients, extraordinary examples of cascades, and examples of unique hydrologic conditions. The revised Outstandingly Remarkable Values provide greater focus on the Merced River and values unique to the region or nation than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to hydrologic processes that could occur within each segment of the Merced River corridor from application of management elements proposed in Alternative 2.

Impacts in Wilderness. Examples of hydrologic-process Outstandingly Remarkable Values of wilderness segments of the main stem and South Fork of the Merced River include glacial remnants, a logjam in Little Yosemite Valley that is hundreds of years old, and numerous cascades, steep gradients, and excellent water quality. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and River Protection Overlay are not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative, these management elements would limit the type of new facilities that could be built (e.g., large campsites with facilities are prohibited in the 1B zone), which could adversely affect hydrology, floodplains, and water quality under the No Action Alternative. Although actions such as trail rehabilitation could occur under the proposed zoning, these actions would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values within wilderness segments of the Merced River (main stem and South Fork) by reducing visitor effects. For example, if VERP monitoring revealed elevated levels of fecal coliform bacteria in the Merced River due to visitor use (e.g., camping or hiking near the Merced River), VERP management actions (e.g., educational signs, limits on visitor use) could be implemented to achieve the desired condition for water quality in the management zone.

Impacts in Yosemite Valley. Hydrologic-process Outstandingly Remarkable Values within Yosemite Valley include the meandering river, world-renowned waterfalls, an active flood regime, oxbows, unique wetlands, and fluvial processes. Yosemite Valley would be zoned to

protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning together with the River Protection Overlay in Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the River Protection Overlay) that have the potential to adversely affect hydrology, floodplains, and water quality. In addition, possible future actions (e.g., bridge removal, bridge or road reconstruction, construction of new campsites) that could occur under the proposed zoning would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- Implementation of the River Protection Overlay could restore the river to more natural geomorphologic conditions through restoration of streambanks and the floodplain. The River Protection Overlay would promote natural processes in the river and floodplain and minimize the alterations of the floodplain due to existing and future facilities. An example of the potential benefit of the River Protection Overlay on the river's hydrologic process would be the potential removal or restriction of facilities near the banks of the river. Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay would allow natural floodplain alterations and lateral movement of the river channel. It also would remove sources of pollutants (e.g., oil), reduce erosion and sedimentation (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation (streambank stabilization). The River Protection Overlay would have the potential to reduce visitor degradation of streambanks and the river channel by limiting the number of locations where human-induced erosion could occur. Additionally, the introduction of refuse and bacteria by visitors could be reduced by the possible realignment or relocation of roads, trails, and visitor facilities. The magnitude of the effect of the River Protection Overlay on hydrologic processes is correlated to the degree to which facilities are removed in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect, whereas removal of several facilities would have a moderate to major, long-term, beneficial effect on the hydrologic processes in Yosemite Valley, an Outstandingly Remarkable Value.
- The potential changes to existing and future structures and visitor use in the 100-year floodplain under Alternative 2 could provide a long-term, minor, beneficial impact in terms of flood protection for park personnel, visitors, and park structures. Flood frequency and hazards are issues in developed areas, such as east Yosemite Valley, where existing structures and visitor-use areas are subject to high water inundation. Alternative 2 would restrict the future placement of nonessential buildings, roadways, and visitor areas and potentially remove structures in the high-frequency flood areas of the River Protection Overlay. The River Protection Overlay provides a buffer area for natural flood flows and channel

formation. Additionally, zones 2B and 2C in the larger floodplain would restrict the placement of park facilities in flood-prone areas. In addition, certain areas are designated as 3A, 3B, and 3C zones, which would lessen potential future flood protection by removing facilities in these flood hazard areas. Overall, flood frequency would be unaffected, but implementation of the criteria for existing and future structures could reduce flood hazards in developed areas and return the flood regime to a more natural state.

- An example of the potential benefit to water quality would be the concentration of visitors and vehicles in the western portion of Yosemite Valley at Cathedral Beach (zoned 2C) and Sentinel Beach (zoned 2C). The designation of much of the river corridor in this area as Discovery (zone 2B) would focus visitor use to the 2C zones listed above. By limiting the currently dispersed use of the Merced River through this portion of Yosemite Valley to concentrated locations, nonpoint sources of pollution, such as refuse, bacteria, and petroleum and metal products associated with vehicles, would become more manageable.
- A majority of the 100-year floodplain in west Yosemite Valley would be zoned 2B and receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging) that have the potential to adversely affect floodplain characteristics (e.g., water recharge rates, flood dissipation), hydrologic processes of the Merced River (e.g., new facilities could constrict the channel of the Merced River), and water quality (e.g., short-term impacts during construction). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to be managed to their desired condition with continued protection, restoration, and enhancement of hydrologic processes, resulting in a long-term, minor to moderate, beneficial impact.
- El Capitan Meadow is a river-related meadow within the 100-year floodplain of the Merced River. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has compacted meadow soils, altering the natural water recharge capabilities of the floodplain at this location. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient location outside the floodplain of the Merced River) at the base of El Capitan. This could increase opportunities for restoration of natural floodplain characteristics, resulting in a minor, site-specific, long-term, beneficial effect.

Examples of how management elements proposed under this alternative could have negative effects on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- A long-term, minor, adverse impact to water quality could occur as a result of the continued and likely increase of nonpoint-source pollution discharge to stormwater runoff from roads, parking lots, and other impervious surfaces introduced into the area to accommodate visitor use. If parking lots, roads, and other impervious surfaces were established where none currently exist, then vehicle-related pollutants and refuse would accumulate. This long-term, minor, adverse impact could be mitigated to a negligible level through the use of permeable surfaces and vegetated or natural filters or traps for filtering stormwater runoff. Other best management practices (Chapter II) for polluted runoff control include oil/sediment separators, street sweeping, and infiltration beds (soil capture of surface pollutants).

- Localized, short-term, minor, adverse impacts on water quality could occur from construction and demolition involving river impoundments, obstructions, or work within the river corridor. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade water quality. The application of construction/demolition best management practices (Chapter II) could lessen the potential for impacts to water quality. Implementation of a Storm Water Pollution Prevention Plan, as prescribed for all construction activities affecting over five acres (to be reduced to one acre in 2003) by the Environmental Protection Agency and the Regional Water Quality Control Board, would help to reduce potential short-term impacts on water quality due to construction activities. Storm Water Pollution Prevention Plans include best management practices for erosion control and containment of potential water quality pollutants. Such measures could reduce the potential adverse impacts to a negligible intensity.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on hydrology, floodplains, and water quality, depending on site-specific conditions and project design. If actions resulted in relocation outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal regulations (e.g., the Clean Water Act, Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*).
- Relocation of facilities to other locations within the river corridor could have site-specific, long-term, negligible to major, adverse effects on hydrology, floodplains, and water quality, depending on site-specific conditions and project design. If actions resulted in relocation within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, long-term, adverse impacts to the floodplain of the Merced River could occur from construction of new facilities. For example, zones 3B and 3C at Camp 6, Housekeeping Camp, and a portion of Yosemite Lodge could allow new construction or reconstruction of facilities within the floodplain of the Merced River. New or reconstructed facilities could permanently alter the floodplain and floodplain characteristics (e.g., water recharge rates, floodwater dissipation) at these locations. Potential adverse effects associated with these zones could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to floodplains) in combination with the implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*.

Although site-specific, short- and long-term, adverse effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 2 would provide increased protection for these river processes and associated Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of hydrologic-process Outstandingly Remarkable Values of the gorge and El Portal include exceptionally steep gradients (2,000-foot elevation drop in approximately six miles) and continuous rapids. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have

a base zone of 2C, with large tracts zoned 3C. Examples of how the management elements of Alternative 2 would affect hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values of the Merced River Gorge and El Portal are provided below.

- Existing facilities, such as Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing the hydrologic processes of this river segment and resulting in minor to moderate, site-specific, long-term, beneficial effect. Minor, short-term, adverse effects to water quality (e.g., sedimentation, oil, grease) could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area; therefore, visitor-induced impacts to water quality (e.g., human-induced erosion, the introduction of refuse and bacteria) could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to minor, adverse impacts on hydrology, floodplains, and water quality. Adverse effects could be mitigated to a negligible intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible, and visitor use and facilities are unlikely to increase. Consequently, there would be no impact on hydrology, floodplains, or water quality for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with the natural hydrologic processes of the Merced River at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location, resulting in a site-specific, minor, beneficial effect.
- Large portions of El Portal within the floodplain of the Merced River would be zoned 3C (e.g., the Trailer Village, Old El Portal), which could allow additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., alteration of floodplain characteristics, alteration of hydrologic processes), minor to moderate, adverse effects on hydrology, floodplains, and water quality. Adverse impacts on water quality (e.g., sedimentation, oil, grease, fuels) would be related to construction (short-term) and use (long-term) of facilities. Adverse effects to the floodplain would be long term (i.e., building new facilities within the floodplain of the Merced River could alter water recharge rates or floodwater dissipation, or increase flood hazard on structures or individuals). Potential adverse impacts on hydrology and hydrologic processes could result from streambank stabilization (e.g., riprap) or channel modifications (e.g., rerouting the flow of the Merced River). These adverse effects to hydrology, floodplains, and water quality would be reduced to no impact or to a negligible to minor intensity by application of the criteria and considerations (including the Section 7 determination process), mitigation measures described in Chapter II (e.g., siting to avoid effects to floodplains, best management practices, oil and sediment separators), implementation of Executive Order 11988 on

floodplain management and the *Floodplain Management Guidelines*, and implementation of VERP management actions.

Repair or redevelopment of existing facilities (e.g., El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future, the National Park Service could propose to reconstruct the El Portal Road. Impacts of the proposed design on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values could include direct and permanent alteration of the floodplain, installation of fill or riprap within the Merced River, erosion and the long-term discharge of pollutants associated with use of the road (e.g., oil, grease, litter). These types of impacts would be long term, moderate to major, and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, Clean Water Act). Through these processes, project designs that avoid and minimize adverse effects to the Outstandingly Remarkable Values (including hydrologic processes) and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress, in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease, because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible intensity.

The application of management elements under this alternative would increase protection and enhancement of hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities within the floodplain of the Merced River that could have short- and long-term negative effects on hydrology, floodplains, and water quality. These impacts could be reduced to a negligible to minor intensity through the application of mitigation measures described in Chapter II, the criteria and considerations (including the Section 7 determination), and implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*.

Impacts in Wawona. Excellent water quality is listed as a hydrologic-process Outstandingly Remarkable Value of the impoundment above Wawona. No specific hydrologic-process Outstandingly Remarkable Values are listed for Wawona. Although the South Fork through Wawona would have a variety of zones, ranging from 1A (designated Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking that have the potential to adversely affect hydrology, floodplains, and water quality. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance

facility (zoned 3C) could continue to function consistent with existing conditions. In general, these facilities are located above the floodplain of the South Fork. The proposed zoning and continued use of these sites are not expected to adversely affect hydrologic processes compared to the No Action Alternative.

Portions of facilities within the River Protection Overlay and floodplain of the South Fork, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. Potential removal would allow natural hydrologic processes to prevail at these locations. It would restore developed zones to natural floodplain and reduce sources of water pollutants, thereby resulting in a long-term, minor, beneficial impact.

An example of an obstruction removal would be the replacement of Wawona Bridge. Design and construction of the bridge would have to conform to criteria to protect and enhance the Outstandingly Remarkable Values of the river, pursuant to Section 7 of the Wild and Scenic Rivers Act (see Chapter II, Site-Specific Elements Common to All Action Alternatives). Removal of the bridge would eliminate in-channel obstructions (bridge pilings) and channel constrictions (bank armament at the bridge abutments). Under Alternative 2, the River Protection Overlay would not allow further degradation of river conditions and would provide for enhancement of the free-flowing condition wherever possible in design and construction of the new bridge. This bridge could be replaced under the River Protection Overlay as an essential park facility, and the adjacent 2B zone would allow for primary roadways leading to the bridge crossing.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term, negligible to minor, adverse effects to water quality (e.g., pollutants associated with construction/demolition) could occur if facilities were removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 2 would have a long-term, negligible to minor, beneficial impact on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 2 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on flood hazards and hydrologic and geomorphic processes and related Outstandingly Remarkable Values within the river corridor, because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could

alter floodplain characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay), in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow the hydrologic and geomorphic processes to remain relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, moderate, beneficial impact on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to hydrology discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect the watershed of the Merced River.

Past Actions. The Merced River has been historically affected by a variety of projects that have introduced obstructions into the river channel, modified the floodplain, and adversely affected water quality. Alterations to hydrology have occurred through development and use within the Merced River corridor since Euro-American settlement. Examples of projects that have had adverse effects on the hydrologic processes of the Merced River include bridges, riprap, removal of large woody debris, dikes, flood walls, impoundments, dams, and buildings.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects the water quality of the Merced River immediately adjacent to the roadway. The free-flowing condition of the Merced River has been adversely altered by direct placement of fill and riprap to widen and stabilize the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and by excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall short-term effects on water quality.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; (3) projects anticipated to have a net adverse effect; and (4) projects that would not affect the hydrological processes of the Merced River.

Examples of projects that could have a cumulative, beneficial effect on hydrological processes in the Merced River include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- South Fork Merced River Bridges Replacement (NPS)

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects on water quality), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, the net cumulative effect of these projects would be a long-term, beneficial impact on hydrological processes of the Merced River.

A reasonably foreseeable project that could have mixed adverse and beneficial effects on hydrological processes includes:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* has the potential to positively affect free flow of the Merced River by the proposed removal of the Cascades Diversion Dam. The *Yosemite Valley Plan* also has the potential to adversely affect water quality during construction activities related to Segment D of the El Portal Road Reconstruction Project (short-term), with the long-term, beneficial effect of improving water quality. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., effects to water quality). Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

However, some of the proposed redevelopment in El Portal (e.g., redevelopment of the sand pit), would be inconsistent with the management zoning in this alternative. The *Merced River Plan*

guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 2 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 2. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on hydrological processes include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Yosemite Motels, El Portal (Mariposa Co.)

Cumulative effects of these potential future projects on the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term, minor, and beneficial.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that have the potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on flood hazards, hydrologic and geomorphic processes, and related Outstandingly Remarkable Values within the river corridor because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Site-specific, short- and long-term, adverse effects on hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could alter floodplain

characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones in east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow the hydrologic and geomorphic processes to remain relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, moderate, beneficial impact on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long-term, minor, and beneficial.

Wetlands

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wetland resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 2.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wetland-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wetland and aquatic habitats). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are wetland-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning overall (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Upper River and Lower River Campgrounds) that have the potential to adversely affect native wetland and aquatic habitats. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance native wetland and

aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive wetland habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of these wetland habitats resulting in a site-specific, long-term, minor, beneficial impact.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient upland location) at the base of El Capitan. This could increase opportunities for revegetation and restoration of natural wetland and aquatic habitats, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native wetland and aquatic habitats is correlated to the amount of facility removal and/or restoration. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside vegetation in Yosemite Valley, an Outstandingly Remarkable Value.
- The 2B zoning over a majority of the west Valley would preclude new launch/removal facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are more resilient to visitor use. Limiting this activity to particular points along the river, as opposed to current management practices which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects could occur at locations such as Sentinel Beach and Cathedral Beach, containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on riparian vegetation, a biological resource-related Outstandingly Remarkable Value. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified site-specific adverse effects to a negligible or minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on wetlands, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on wetlands, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor, short-term, adverse, temporary effects on native wetland and aquatic habitats could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native wetland and aquatic habitats. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to native wetland and aquatic habitats to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 2 would provide increased protection for native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wetland-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 2 would affect native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation,

resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).

- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter, trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on native wetland and aquatic habitats. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to change. Consequently, there would be no impact on wetland and aquatic habitats or wetland-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., radiating impacts from development), minor to moderate, adverse effects on native wetland and aquatic habitats. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts, long-term, minor to moderate, negative effects to native wetland and aquatic habitats (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, Federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse

effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term, negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wetland-related Outstandingly Remarkable Values, other vegetation resources, such as upland scrub or woodlands, could be adversely affected (long term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wetland-related Outstandingly Remarkable Values of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by visitors, and a nearly full range of riverine environments typical to the Sierra Nevada. The wilderness segments of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native wetland and aquatic habitats). Although possible future actions, such as trail rehabilitation, could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g.,

educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Although the South Fork through Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. The proposed zoning and continued use of these sites is not expected to adversely affect site-specific wetland and aquatic habitats resources compared to the No Action Alternative.

Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated thereby increasing opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor, adverse effects to wetland and aquatic habitats could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 2 would have a long-term, negligible to minor, beneficial impact on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 2 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wetland and aquatic habitats (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative affects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively

unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, moderate, beneficial effects on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wetland and aquatic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to affect local wetland patterns (i.e., within the river corridor) as well as large-scale or regional wetland patterns.

Past Actions. Aquatic and riparian systems are the most altered and impaired habitats of the Sierra Nevada and are relatively rare in the context of the entire landscape. Wetlands in the Sierra Nevada have been drained since the earliest settlers attempted to “reclaim” meadows and other seasonally wet areas. Mountain meadows were commonly drained with the intent of improving forage conditions and to permit agriculture (Hughes 1934, as in NPS 1997b, University of California, Davis 1996). Development and activity in Yosemite National Park has reduced historic wet meadow acreage by 60-65%. Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, agriculture, buildings, campgrounds, and recreational features. Dams and diversions throughout most of the range have profoundly altered stream-flow patterns and water temperatures. Within the mountains, broad valleys with wide riparian areas were often reservoir sites, and much of the best former riparian habitat in the Sierra Nevada is now under water. The extent of the inundation across the range becomes apparent when one realizes that virtually all flatwater on the western slope of the Sierra Nevada below 5,000 feet is artificial (University of California, Davis 1996). These past actions have had long-term adverse effects on regional wetland and aquatic habitats.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wetlands of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values

in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wetlands include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, and Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- South Fork Merced River Bridges Replacement (NPS)

Although each of these projects may have site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wetlands. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wetland resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example is the update to the *Yosemite Wilderness Management Plan*, which could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wetlands include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term, beneficial impact to wetland resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature riparian vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 2 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 2. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional wetlands include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June

Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)

- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional growth. Each of the aforementioned projects has the potential to have site-specific, adverse effects on wetland and aquatic resources during construction (short-term) and by direct displacement of resources (long-term). Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to wetland and aquatic resources, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement.

Wetland and riparian systems of the Merced River and the Sierra Nevada have been substantially altered by development and visitor activities. These changes have negatively influenced wetland size, form, and function and the plants, wildlife, and aquatic species that inhabit them. Cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wetlands include wetland restoration, rehabilitation projects, and ecosystem management. Cumulative adverse effects would be related to past, present, and reasonably foreseeable increased facilities, regional growth, and visitor demand. Several of these cumulative actions could have a long-term, beneficial effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor. However, throughout the Sierra Nevada and larger region, regional development and growth could have a net long-term, adverse effect on regional wetland and aquatic resources that would not be compensated by local or regional planning and restoration projects. Therefore, cumulative adverse effects on regional wetland and aquatic habitats due to past, present, and reasonably foreseeable actions, could be major, adverse, and long term.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable

future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 2 could have a net long-term, major, adverse effect on regional wetland patterns.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wetland (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wetland and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wetland could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native wetland and wetland-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 2 could have a long-term, major, adverse effect on regional wetland patterns.

Vegetation

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act, Clean Water Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to vegetation resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 2.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of vegetation-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation) under the No Action Alternative. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are vegetation-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning overall (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect native vegetation. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance native vegetation and vegetation related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient upland location) at the base of El Capitan. This could increase opportunities for revegetation and restoration of natural vegetation, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.

- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native vegetation is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside vegetation in Yosemite Valley, an Outstandingly Remarkable Value.
- The 2B zoning over a majority of the west Valley would preclude new launch/removal facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are more resilient to visitor use. Limiting this activity to particular points along the river, as opposed to current management practices which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects could occur at locations such as Sentinel Beach and Cathedral Beach, containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on riparian vegetation, a biological resource-related Outstandingly Remarkable Value. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified site-specific adverse effects to a negligible or minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on native vegetation and vegetation-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- The Developed zones (zone 3A, 3B, and 3C) are designed to direct high-impact activities and facilities to areas better able to withstand heavy use and/or to those areas already developed. These zones could absorb the most concentrated visitor and administrative use with a higher tolerance for resource degradation. The woodlot and Pohono Quarry would be zoned 3C, consistent with current use. The proposed 3C zoning at either Taft Toe or Camp 6 and the 3B zoning at Yosemite Lodge could allow construction of new park facilities (e.g., parking, trail hardening). The 3A zoning at the existing North Pines, Lower Pines, and Upper Pines Campgrounds would allow construction of new campground facilities. New facilities could affect native vegetation such as black oak woodland and coniferous forest at these locations, increase human trampling of understory species in the immediate area, increase nonpoint-source pollution and refuse, decrease connectivity between habitats and the river, and increase the potential for introduction and spread of non-native species. It is anticipated that naturally occurring fires would be controlled around new structures, similar to existing park policy, and that this could affect species composition and forest health in the immediate vicinity of structures over the long term. Plant species richness and diversity generally decline where recreational activities occur, due to the physical effect of trampling itself and the tendency of plants with more resistance (tougher leaves, growth points below the ground surface, rapid growth rate, numerous seeds, etc.) to crowd out other species (Cole 1993). Overall, the structural form, connectivity, size, productivity, and diversity of native vegetation located at and in the vicinity of potential development sites could be adversely affected (long-term, adverse, and moderate to major in intensity). The application of

mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified effects to a minor or negligible intensity.

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor, short-term, temporary effects on native vegetation could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native vegetation. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to native vegetation to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 2 would provide increased protection for native vegetation and vegetation-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of vegetation-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 2 would affect native vegetation and vegetation-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flow condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation

measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).

- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter, trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on native vegetation. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on vegetation or vegetation-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., fire suppression in the vicinity of structures), minor to moderate, adverse effects on native vegetation. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to native vegetation (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major, and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During

reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of vegetation and vegetation-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect vegetation-related Outstandingly Remarkable Values, other vegetation resources (e.g., upland scrub or woodlands) could be adversely affected (long term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of vegetation-related Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by humans, and a nearly full range of riverine environments typical to the Sierra Nevada. The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Although the South Fork in Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day visitor parking. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. The proposed zoning and continued use of these sites is not expected to adversely affect site-specific vegetation resources compared to the No Action Alternative.

Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. This could increase opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term, negligible to minor, adverse effects to vegetation could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 2 would have a long-term negligible to minor, beneficial impact on native vegetation and vegetation-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 2 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, moderate, beneficial effects on vegetation and vegetation-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to vegetation discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local vegetation patterns (i.e., within the river corridor) as well as large-scale or regional vegetation patterns.

Past Actions. In general, vegetation patterns of the Sierra Nevada are relatively intact compared to other areas of California. Regional vegetation has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Portions of the Merced River and South Fork corridors within Yosemite National Park are relatively natural, especially in wilderness areas where use has had little effect on vegetation. Development and use of infrastructure within Yosemite Valley and throughout the Sierra Nevada have caused long-term, adverse alterations to native vegetation patterns since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects vegetation of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional vegetation include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native vegetation. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional vegetation include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect vegetation resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater

treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to vegetation resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 2 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 2. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional vegetation include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on vegetation resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native vegetation patterns. Regional population growth primarily affects regional vegetation patterns through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to vegetation, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, major, adverse effect on regional vegetation resources that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 2 could have a net long-term, major, adverse effect on regional vegetation patterns.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities

(management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 2 could have a net long-term, major, adverse effect on regional vegetation patterns.

Wildlife

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan, Yosemite Resources Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wildlife resources that could occur within each segment of the Merced River corridor from application of management elements in Alternative 2.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wildlife-related Outstandingly Remarkable Values of the upper Merced River include riverine wildlife habitats such as riparian forests, meadows, and the aquatic environment of the river and

associated special-status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wildlife). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Yosemite Valley. Riparian areas and low-elevation meadows are the most productive communities in Yosemite Valley. The high quality and large extent of riparian, wetland, and other riverine areas provide rich habitat for a diversity of river-related species, including special-status species, neotropical migrant songbirds, and numerous bat species. These are examples of wildlife-related Outstandingly Remarkable Values within Yosemite Valley.

Yosemite Valley would be zoned to protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning overall (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Cathedral Beach) that have the potential to adversely affect native wildlife. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, minor, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance (i.e., beneficial effect) native wildlife and wildlife-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for species likely to occur there, such as California newt and western aquatic garter snake, and would increase protection of potential California red-legged frog habitat (a wildlife-related Outstandingly Remarkable Value).
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (an upland location lacking high value resources that is more resistant to adverse impacts) at the base of El Capitan. This could increase opportunities for revegetation and restoration of natural vegetation and wildlife habitat, resulting in a minor to moderate, site-specific, long-term, beneficial effect to the wildlife habitat of El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native wildlife is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a minor to major, long-term, beneficial effect on streamside wildlife in Yosemite Valley, an Outstandingly Remarkable Value.
- The 2B zoning over a majority of the west Valley would preclude new launch/take out facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are more resilient to visitor use. Limiting this activity to particular points along the river, as opposed to current management practices which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects to wildlife could occur at locations such as Sentinel Beach and Cathedral Beach (e.g., nonmotorized watercraft could have a minor, adverse impact on fish habitat, mainly through riparian vegetation impacts but also due to pool-riffle structure), containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on the riparian wildlife habitat, a biological resource-related Outstandingly Remarkable Value. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management

actions could reduce the severity of the identified site-specific adverse effects to a negligible to minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on native wildlife and wildlife related Outstandingly Remarkable Values in Yosemite Valley include the following:

- The Developed zones (zone 3A, 3B, and 3C) are designed to direct high-impact activities and facilities to areas able to withstand heavy use and/or to those areas already developed. These zones could absorb the most concentrated visitor and administrative use with a higher tolerance for resource degradation. The woodlot and Pohono Quarry would be zoned 3C, consistent with current use. The proposed 3C zoning at either Taft Toe or Camp 6 and the 3B zoning at Yosemite Lodge could allow construction of new park facilities (e.g., parking, trail hardening). The 3A zoning at the existing North Pines, Lower Pines, and Upper Pines Campgrounds would allow construction of new campground facilities. New facilities could affect native wildlife habitats such as black oak woodland and coniferous forest at these locations, increase human trampling of understory species in the immediate area, increase nonpoint-source pollution and refuse, decrease connectivity between habitats and the river, and increase the potential for introduction and spread of non-native species. It is anticipated that naturally occurring fires would be controlled around new structures, similar to existing park policy, and that this could affect habitat composition in the immediate vicinity of structures over the long term. Species richness and diversity generally decline where recreational activities occur (Cole 1993). In addition, walk-in camps, greater distance between parking and campsites could result in a higher incidence of food in vehicles, leading to more food conditioning of bears and property damage. The higher use could over time indirectly affect wildlife diversity in the immediate area, due to a decrease in connectivity between habitats and the river, and could increase the potential for introduction and spread of non-native species such as the bullfrog, or parasitic species such as the cowbird. Disturbance-tolerant plants and animals would increase, at the expense of species sensitive to disturbance or with sensitive habitat elements (e.g., meadows and dependent wildlife species such as California voles and foraging raptors). Overall, the structural form, connectivity, size, productivity, and diversity of native wildlife and wildlife habitat located at and in the vicinity of potential development sites could be adversely affected (long-term, adverse, and moderate to major in intensity). The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified effects to a negligible to moderate intensity.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse affects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal regulations (e.g., the federal Endangered Species Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.

- Localized, minor to major, short-term, temporary effects on wildlife could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, noise, and introduction and spread of non-native species. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. The application of mitigation measures (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could lessen the potential for impacts to wildlife habitats (described in Chapter II). Implementation of such measures could reduce the potential adverse impacts to a negligible to moderate intensity.

Although site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 2 would provide increased protection for native wildlife and wildlife-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wildlife-related Outstandingly Remarkable Values of the Merced River gorge include diverse riparian areas that are largely undisturbed by humans and river-associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 2 would affect native wildlife and wildlife-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment and fish habitat. This could increase opportunities for revegetation and restoration of riparian habitats, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value.
- Localized, minor to major, short-term, temporary effects on wildlife could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, noise, and introduction and spread of non-native species. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. The application of mitigation measures (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could lessen the potential for impacts to wildlife habitats (described in Chapter II). Implementation of such measures could reduce the potential adverse impacts to a negligible to moderate intensity.
- New or expanded facilities (e.g., parking) could be built within the 2D zone below Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter (attractants for a number of wildlife including bears), trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on native

wildlife. Adverse affects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II.

- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on wildlife or wildlife-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with riverine habitat and natural regeneration of riparian habitat at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed, which would allow for natural processes to prevail at this location, enhance the aquatic habitat (e.g., the removal of sources of pollutants would improve water quality and increase habitat values) and allow natural revegetation with riparian species. This could result in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, human presence, fire suppression in the vicinity of structures), minor to major, adverse effects on native wildlife. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, shielded lighting, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts to long-term, minor to moderate, negative effects to native wildlife (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this

alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wildlife and wildlife-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wildlife-related Outstandingly Remarkable Values, other wildlife resources, such as upland wildlife species (e.g., bears, deer) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wildlife-related Outstandingly Remarkable Values of wilderness segments of the South Fork include a nearly full range of riverine environments typical to the Sierra Nevada that are largely intact and undisturbed by humans. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog.

The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflect current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wildlife), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, they would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian habitat based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Wawona. Examples of wildlife-related Outstandingly Remarkable Values of Wawona includes diverse riparian areas that are intact and largely undisturbed by humans. River-related federal and state special-status species in this segment include Wawona riffle beetle.

Although the South Fork in Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking. This would result in a long-term, minor beneficial impact. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. The proposed zoning and continued use of these sites is not expected to adversely affect site-specific wildlife resources compared to the No Action Alternative.

Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. This could increase opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to wildlife could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 2 would have a long-term negligible to minor beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 2 Impacts. For the duration of the plan, management zoning and the River Protection Overlay would preclude various types of new development that have the potential to adversely affect native wildlife (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor. These elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wildlife patterns (i.e., within the river corridor) as well as large-scale or regional wildlife patterns.

Past Actions. Wildlife communities have been manipulated almost since the beginning of the park. Regional wildlife has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Fur-bearing mammals were trapped by park rangers until 1925; lions were considered dangerous predators and controlled through the 1920s; bears were artificially fed as a tourist attraction until 1940. Natural wildfires, with their generally beneficial effects on wildlife habitat, were routinely suppressed until 1972 (Wuerthner 1994). Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

Yosemite's largest mammal, the grizzly bear, was extirpated from the region and from the state in the 1920s. Other mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by human activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including Yosemite National Park. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes.

Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Most fish currently found in the Merced River and its tributaries in Yosemite National Park have been introduced. Prior to trout stocking for sport fishing, native fish in Yosemite were probably limited to the rainbow trout and the Sacramento sucker, both of which were present only in the lower portions of the Merced River (i.e., Yosemite Valley and below). Rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or has displaced, the original strain.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general

management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wildlife of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wildlife include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wildlife. For example, the update to the

Yosemite Wilderness Management Plan could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wildlife include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco),
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wildlife resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to wildlife resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) wildlife, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 2 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 2. Components of the *Yosemite Valley Plan* would need to change to conform with this alternative.

The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional wildlife include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native wildlife patterns. Regional population growth primarily affects regional wildlife patterns through construction (e.g., new housing and infrastructure) and human use. Examples of construction- and human-use-related effects on wildlife patterns include direct displacement of wildlife (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). More importantly, some of the projects provide for increased residential growth adjacent to the park and would accommodate increased recreational development. In total, regional development and growth could have a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. For the species at higher elevations, the effects are somewhat mitigated by resource protection planning and restoration. Although each new development is required to mitigate or compensate for adverse effects to wildlife, the mitigation/compensation is generally

uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate, adverse effect on regional wildlife resources that would not be compensated by regional planning and restoration projects discussed above.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be moderate, adverse, and long term.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wildlife (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed Zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions would be moderate, adverse, and long term.

Rare, Threatened, and Endangered Species

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to rare, threatened, and endangered species that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 2.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of biological resource Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, or endangered species). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, or endangered species and related

Outstandingly Remarkable Values of the wilderness segment of main stem Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows, a habitat for rare, threatened, or endangered species, based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are biological resource Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning overall (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect rare, threatened, or endangered species. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for special status-species likely to use wet meadows for foraging, such as western mastiff bat.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient upland location) at the base of El Capitan. This could increase opportunities for rare, threatened, and endangered species and restoration of natural rare, threatened, and

endangered species, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow and a variety of special-status species which are also Outstandingly Remarkable Values, such as great gray owl, foothill yellow-legged frog, and numerous bat species.

- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for rare, threatened, and endangered species and restoration of riparian vegetation. Removal of obstructions may lead to seasonal creation of back-channel pools (a habitat niche now largely unavailable), which could improve conditions for native amphibians currently absent from the park, such as California red-legged frog. The magnitude of the effect of the River Protection Overlay on rare, threatened, and endangered species is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside habitats for river-associated rare, threatened, or endangered species in Yosemite Valley, an Outstandingly Remarkable Value.
- The 2B zoning over a majority of the west Valley would preclude new launch/removal facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are more resilient to visitor use. Limiting this activity to particular points along the river, as opposed to current management practices which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects could occur at locations such as Sentinel Beach and Cathedral Beach, containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on riparian species. Use of non-motorized watercraft could have a minor but more dispersed adverse impact on special-status wildlife (e.g., yellow warbler), mainly through riparian vegetation impacts but also due to noise. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified site-specific adverse effects to a negligible or minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- The Developed zones (zone 3A, 3B, and 3C) are designed to direct high-impact activities and facilities to areas able to withstand heavy use and/or to those areas already developed. These zones could absorb the most concentrated visitor and administrative use with a higher tolerance for resource degradation. The woodlot and Pohono Quarry would be zoned 3C, consistent with current use. The proposed 3C zoning at either Taft Toe or Camp 6 and the 3B zoning at Yosemite Lodge could allow construction of new park facilities (e.g., parking, trail hardening). The 3A zoning at the existing North Pines, Lower Pines, and Upper Pines Campgrounds would allow construction of new campground facilities. New facilities could affect rare, threatened, or endangered species, if present, at these locations, increase human trampling of understory species in the immediate area, increase nonpoint-source pollution and refuse, decrease connectivity between habitats and the river, and increase the potential for

introduction and spread of non-native species. It is anticipated that naturally occurring fires would be controlled around new structures, similar to existing park policy, and that this could affect species composition in the immediate vicinity of structures over the long term. Species richness and diversity generally decline where recreational activities occur (Cole 1993). Overall, the structural form, connectivity, size, productivity, and diversity of rare, threatened, and endangered species located at and in the vicinity of potential development sites could be adversely affected (long-term, adverse, and moderate to major in intensity). The higher use over time could indirectly affect wildlife diversity in the immediate area due to a decrease in connectivity between habitats and the river, and an increase in the potential for introduction and spread of non-native species such as the bullfrog, or parasitic species such as the cowbird. Disturbance-tolerant plants and animals would increase, at the expense of species sensitive to disturbance or with sensitive habitat elements (e.g., meadows and dependent wildlife species, such as California voles and foraging raptors). Rare, threatened, or endangered species directly or indirectly affected could include northern goshawk, yellow warbler, great gray owl, and special-status bats. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified effects to a minor or negligible intensity.

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., federal Endangered Species Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor, short-term, temporary effects on special-status species could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native habitats. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. Bridge removal could also adversely affect roosting bats (if present). The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to special-status species to a negligible intensity.

Although site-specific, short- and long-term, negative effects to rare, threatened, or endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 2

would provide increased protection for rare, threatened, or endangered species and related Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 2 would affect rare, threatened, and endangered species and related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Removal of obstructions may lead to seasonal creation of back-channel pools (a habitat niche now largely unavailable), which could improve conditions for native amphibians currently absent from the park, such as California red-legged frog. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter, trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on rare, threatened, and endangered species. Adverse affects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on rare, threatened, and endangered species or related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation, such as blue elderberry—host plant for the Valley elderberry longhorn beetle. It may also adversely impact the recently identified population of Cogdon’s wooly sunflower at this site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, noise, fire suppression in the vicinity of structures), minor to moderate, adverse effects rare, threatened,

and endangered species. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to rare, threatened, and endangered species (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of rare, threatened, and endangered species and related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect river-related rare, threatened, and endangered species (Outstandingly Remarkable Values), other rare, threatened, and endangered species (e.g., upland rare, threatened, and endangered species) would be mitigated for during consultation with the U.S. Fish and Wildlife Service pursuant to the federal Endangered Species Act.

Impacts in Wilderness Segments of the South Fork. Examples of biological resource Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by

humans, and a nearly full range of riverine environments typical to the Sierra Nevada. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog. The upper (above Wawona) and lower (below Wawona) portions of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, and endangered species), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, and endangered species and related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Although the South Fork in Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day visitor parking. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. The proposed zoning and continued use of these sites is not expected to adversely affect site-specific rare, threatened, and endangered species compared to the No Action Alternative.

Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. This could increase opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation and habitat for river-related rare, threatened, and endangered species, a biological resource Outstandingly Remarkable Value.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to vegetation could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation

measures described in Chapter II. Overall, Alternative 2 would have a long-term negligible to minor beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 2 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to rare, threatened, and endangered species discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region. The intensity of impact depends on whether the impacts are anticipated to interact cumulatively. For example, factors external to the park, such as broad regional habitat degradation and pesticide use, can combine with existing, in-park impacts, such as non-native species, to cause declines in rare, threatened, or endangered amphibians (e.g., mountain yellow-legged frog and Yosemite toad), an adverse, cumulative impact. The projects identified below include those projects that have the potential to effect populations of rare, threatened, or endangered species (i.e., within the river corridor) as well as large-scale or regional populations of the same species.

Past Actions. Natural habitats have been manipulated almost since the beginning of the park. Regional wildlife and vegetation patterns have been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by visitor activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much

to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Past and ongoing activities that affect rare, threatened, or endangered species include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects habitats immediately adjacent to the roadway. Special-status species with potential to be affected during construction include Valley elderberry longhorn beetle, roosting bats, peregrine falcon, and Tompkin's sedge. Special-status roosting bats could be affected, primarily through the noise generated by construction equipment and blasting. Blasting is also a concern for the peregrine falcon, known to occur at the Cascades aerie in the project vicinity (the peregrine was recently delisted but continues to be a species of concern in the park). Adverse effects to these species are avoided or minimized during construction by implementation of a compliance monitoring program, pre-construction surveys, erosion and sediment controls, minimizing noise during sensitive biological periods, construction timing restrictions, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional rare, threatened, or endangered species include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional rare, threatened, or endangered species. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional rare, threatened, and endangered species include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect rare, threatened, and endangered species during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to rare, threatened, and endangered species by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 2 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 2. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional rare, threatened, and endangered species include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at

Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)

- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on rare, threatened, and endangered species during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including rare, threatened, and endangered species. Regional population growth primarily affects regional rare, threatened, and endangered species through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on rare, threatened, and endangered species include direct displacement of rare, threatened, and endangered species (e.g., nest trees removed and replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., the spread of yellow star thistle by construction equipment and its subsequent adverse impacts on special status plant species), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to rare, threatened, and endangered species, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate to major (depending on species-specific impacts), adverse effect on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have long-term, moderate to major (depending on species-specific impacts), adverse cumulative impacts on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above. These cumulative actions in combination with Alternative 2 could have a net long-term, major, adverse effect on regional rare, threatened, and endangered species.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and

considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional rare, threatened, and endangered species (e.g., introduction and spread of non-native species, direct displacement of habitat by structures). These cumulative actions in combination with Alternative 2 could have a net long-term, major, adverse effect on regional rare, threatened, and endangered species.

Air Quality

Analysis

General Impacts. As a general matter, under Alternative 2, air quality in the corridor would continue to be influenced by local sources within the park and by regional sources upwind of the park. The differences between air quality conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 2, “air quality” would be eliminated as an Outstandingly Remarkable Value along all river segments; construction or demolition activities could be more frequent and extensive; a centralized transit center and/or day-visitor parking facility could be developed; the number of day-visitor parking spaces could be reduced; and the number of campsites could increase or decrease.

Under Alternative 2, air quality would be removed from the list of Outstandingly Remarkable Values along all segments of the main stem of the Merced River and the South Fork within the park. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of

the Wild and Scenic Rivers Act. Air quality has been removed as an Outstandingly Remarkable Value because it is not river-related nor is it unique in the region or nation. However, the removal would not affect air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value. Emissions sources in the park would continue to be regulated pursuant to applicable provisions of the federal Clean Air Act, local air district *Rules and Regulations*, park campfire regulations, the *Fire Management Plan*, and state and federal motor-vehicle emissions control programs.

Under this alternative, some facilities could be constructed and other facilities removed based on the new management zoning designations. Construction or demolition activities could generate substantial amounts of dust (including particles with diameters of 10 microns or less [PM-10] and particles with diameters of 2.5 microns or less [PM-2.5]) primarily from “fugitive” sources (i.e., emissions released through means other than through a stack or tailpipe) and lesser amounts of other criteria air pollutants, primarily from operation of heavy equipment. Dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, construction activities could result in significant quantities of dust, and, as a result, local visibility and PM-10/PM-2.5 concentrations could be adversely affected. Without mitigation, dust raised by construction or demolition activities would have a major but temporary effect in the immediate vicinity of individual sites.

Best management practices are available to reduce construction- and demolition-related air quality impacts and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. Generally, these practices include watering active construction areas; covering trucks hauling materials that could spill onto paved surfaces; sweeping (with water sweepers) paved areas that are subject to vehicle traffic and on which soil materials have been deposited; stabilizing inactive construction areas; covering stockpiles; limiting vehicle speeds on unpaved areas; installing erosion control measures; and timely revegetation. All of these measures would not apply at each construction or demolition site. Generally, larger, more intensive construction or demolition projects require more comprehensive dust abatement programs than smaller, less intensive projects. Implementation of the best management practices would reduce the temporary and localized air quality impacts from construction or demolition activities to a minor level.

The 3C zone in Alternative 2 would accommodate a new transit center and/or day-visitor parking facility at either Taft Toe or Camp 6. If such a facility were developed, the effect on air quality would be beneficial by reducing vehicle-miles-traveled within the Valley, although air quality in the immediate vicinity of the transit center and/or day-visitor parking facility itself would experience a minor, local, adverse effect due to the concentration of vehicular emissions in that area. The magnitude of the potential Valleywide beneficial effect would depend upon the types of technology used to transport visitors within the Valley. For instance, as a general matter, diesel-powered vehicles generate substantially greater exhaust emissions of PM-10/PM-2.5 than gasoline-powered vehicles, and the net effect of replacing gasoline-powered autos with diesel-powered buses would depend upon the number of vehicle-miles-traveled by autos that would be displaced, but could potentially be negative. However, if the National Park Service were to consider net emissions effects in the selection of the technology for expanded in-Valley shuttle service (that would naturally arise from development of a transit center and/or day-visitor parking

facility at Taft Toe or Camp 6), then a moderately beneficial impact from the standpoint of Valleywide air quality would be assured.

If a transit center and/or day-visitor parking facility were to be developed at Camp 6, a traffic check station would be developed at Taft Toe. This traffic check station would result in a local, long-term, minor, adverse effect on air quality in the immediate vicinity of that station, due to the concentration of slow-moving and idling traffic in that area. Generally, vehicles emit greater relative amounts of air pollutants at slower speeds and when idling than when moving at higher speeds.

Under Alternative 2, the number of day-visitor parking spaces could be reduced relative to Alternative 1, because some of these spaces would be located in areas in which they would be inconsistent with the 2A and 2B zones. If these parking areas were simply removed from the corridor and not relocated, long-term air quality in the Valley would be adversely affected by increased vehicular congestion from visitors searching for remaining parking spaces or parking in nondesignated areas. Such congestion would lead to a minor, adverse impact due to the localized concentration of vehicular emissions. Coordination of parking space removal with development of a transit center and/or parking area facility at Taft Toe or Camp 6 would effectively remedy this impact.

Lastly, under Alternative 2, the overall number of campsites could be higher or lower than under the No Action Alternative. An example of a potential increase in overnight accommodation facilities under Alternative 2 is associated with the areas adjacent to Upper Pines Campground and Camp 4 (Sunnyside Campground) that do not currently have camping uses, which would be zoned 3A and could be converted to camping. In addition, an area in Section 35 in Wawona that does not currently have camping use would be zoned 3A/3C and could be developed for camping use. A reduction in the number of campsites would have a minor, beneficial effect by reducing the number of campfires and related emissions within the Valley on the typically busy days when the campgrounds would be full. Conversely, an increase in the number of campsites could have a minor, adverse effect by increasing the number of campfires and associated emissions; however, a redesign of a campground could also increase the number of sites without increasing campfire-related emissions by providing for group fire rings rather than providing a fire ring at each site.

Summary of Alternative 2 Impacts. Under Alternative 2, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value, and since emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with site-specific construction or demolition activities within the corridor. Over the long term, this alternative would accommodate development of a new transit center and/or day-visitor parking facility, which could result in a long-term, local, moderate, beneficial effect due to reduced vehicle travel and related emissions in the eastern part of the Valley, but which would also result in a long-term, local, minor, adverse effect in its immediate vicinity and in the vicinities of related facilities (such as the traffic check station or removal of existing parking areas) due to the increased concentration of vehicular activity and associated emissions at those locations.

Cumulative Impacts

Cumulative effects to air quality discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect air quality within the river corridor or that could be affected by air pollutant sources within the river corridor.

Past Actions. Since 1950, the population of California has tripled, and the rate of increase in vehicle-miles-traveled has increased six-fold. Air quality conditions within the park have been influenced by this surge in population growth and its associated emissions from related industrial, commercial, and vehicular sources in upwind areas as tempered by a burgeoning regulatory apparatus. Since the 1970s, emissions sources operating within the park, as well as California as a whole, have been subject to local stationary-source controls and state and federal mobile-source controls. With the passage of time, such controls have been applied to an increasing number of sources, and the associated requirements have become dramatically more stringent and complex. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles and their related emissions until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The 1990 *Fire Management Plan* was developed to address management issues related to prescribed natural burns, prescribed burns, and wildfires in the park. Implementation of the smoke management policies of the 1990 *Fire Management Plan* reduces the potential for burns or wildfires to have a major effect on air quality in the park or in the park vicinity.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both negative (short-term during construction) and potentially beneficial (long-term) effects on air quality. Short-term, construction-related effects include dust and other pollutant emissions associated with operation of construction equipment, earthmoving activities, and vehicle travel over unpaved surfaces. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which could have a long-term, beneficial impact by reducing automobile trips.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects not anticipated to have a net adverse or beneficial, long-term effect.

Examples of projects that could have a cumulative, beneficial, long-term effect on air quality include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by

expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park.

- The San Joaquin Corridor Rail Projects (DOT, Amtrak) would contribute to a long-term, beneficial impact on air quality because such improvements would encourage travel by alternative (non-private vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resources Management Building (NPS) are two projects that would reduce work/home commutes for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Reconstruction Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term, major, adverse impacts on local air quality primarily due to dust from construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle emissions.
- Several other regional projects that will have a net beneficial effect on air quality by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS) and the Expansion of Mariposa County Transit System.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would have a beneficial, long-term effect on air quality.

Reasonably foreseeable future actions that could have an adverse effect on air quality include:

- Revisions to the 1990 *Yosemite Fire Management Plan* and development of the U.S. Forest Service's *Fire Management Action Plan for Wilderness*, which could lead to increased use of prescribed burning techniques
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects, the A-Rock Reforestation, the Fire Management Action Plan for Wilderness (USFS, Stanislaus), and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The Wawona Campground Improvement (NPS)
- Various development-related projects such as the Mariposa County General Plan Update; Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); and the Buildout of City of Merced, General Plan

- The Highway 41 Extension (Madera Co.), which would not be a land use development project but would remove an obstacle to land use development (and associated emissions) in the fast-growing area north of Fresno

Revisions to 1990 *Yosemite Fire Management Plan*, the development of the *Fire Management Action Plan for Wilderness* (USFS, Stanislaus), and the fuels and reforestation projects could lead to increased use of prescribed burning techniques and could have an intermittent, long-term, adverse effect on local and regional air quality and visibility, depending upon the extent to which these projects protect air resources. The Wawona Campground Improvement (NPS) would construct additional campsites, which could result in increased local emissions from campfires, unless the overall project (which would also involve rehabilitation of an existing campground) provides for group fire rings, rather than fire rings at each campsite.

Cumulative growth in the region, and the transportation projects such as the Highway 41 Extension (Madera Co.) that support cumulative growth, would have localized, short-term, construction-related impacts; over the long term, these projects would generate emissions of ozone precursors and particulate matter primarily due to associated motor vehicle trips.

Reasonably foreseeable future actions not anticipated to have a net adverse or beneficial effect on air quality, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); and South Fork Merced River Bridges Replacement (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration Project (NPS); update to the Yosemite Wilderness Management Plan (NPS); Tamarack Campground Rehabilitation (NPS); Bridalveil Horse Camp Rehabilitation (NPS); Yosemite Creek Campground Rehabilitation (NPS); and the South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM)
- Land exchanges, such as Yosemite View Parcel Land Exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on air quality due to construction activities, and, in some cases, these effects would occur within the corridor. With respect to long-term effects, a distinction can be made between ozone and particulate matter. For ozone, regional emissions trends suggest that the combination of the beneficial effect of ongoing regional, state, and federal regulatory controls (particularly mobile-source control programs) with the adverse effect of existing and future land use development and associated stationary, area, and mobile emissions sources would result in a regional, moderate, beneficial effect. That is, the beneficial effect of past and present actions that regulate stationary and mobile emissions sources and reasonably foreseeable future actions that have the potential to reduce vehicle trips and vehicle-miles-traveled would offset the adverse effect of ozone precursor emissions associated with increased cumulative growth in the region, leading to a gradual improvement in ozone air quality.

For particulate matter, the net cumulative effect is more difficult to determine, since ambient concentrations of particulate matter reflect primary (i.e., directly emitted) particles as well as secondary (i.e., derived through photochemical reactions involving precursor pollutants) particles derived from emissions of volatile organic compounds, nitrogen oxides, and sulfur oxides. One of the principal sources of directly emitted particles is entrainment of dust by vehicles moving over paved roads, and this component of particulate matter would increase in proportion to increases in vehicle-miles-traveled associated with cumulative growth. One of the secondary sources of particulate matter, sulfur oxides, would also continue to increase with cumulative growth. In contrast, as discussed above in connection with ozone, emissions of volatile organic compounds and nitrogen oxides would continue a downward trend despite cumulative growth, and thus, their contribution to particulate matter concentrations would diminish. Furthermore, unlike ozone, which is considered a regional pollutant, particulate matter reflects both local and regional sources, and the relative influence of these two basic types of sources changes from day to day. Thus, given the opposing emissions trends and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the cumulative effect relative to particulate matter would be beneficial or adverse; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Alternative 2 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 2 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 2; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary from day to day and season to season. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 2 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Conclusions

Under Alternative 2, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, because no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value and because emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with construction or demolition activities within the corridor. Over the long term, this alternative would accommodate development of a new transit center and/or day-visitor parking facility, which

could result in a long-term, local, moderate, beneficial effect due to reduced vehicle travel and related emissions in the eastern part of the Valley, but which would also result in a long-term, local, minor, adverse effect in its immediate vicinity and in the vicinities of related facilities (such as the traffic check station or removal of existing parking areas) due to the increased concentration of vehicular activity and associated emissions at those locations.

Alternative 2 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 2 would not occur in the vicinity of and at the same time as cumulative construction projects; thus, the local, short-term, adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 2; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary on a daily and seasonal basis. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 2 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Noise

Analysis

General Impacts. As a general matter, under Alternative 2, the acoustical environment in wilderness areas would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights, and the acoustical environment in non-wilderness areas would continue to be influenced by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. The differences between noise conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 2, “natural quiet” would be eliminated as an Outstandingly Remarkable Value along certain river segments; construction or demolition activities could occur; and a centralized transit center and/or day-visitor parking facility could be developed.

Under Alternative 2, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along those segments of the main stem of the Merced River (wilderness) and the South Fork (wilderness and below Wawona) for which “natural quiet” is currently listed as an Outstandingly Remarkable Value. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating

Council guidelines for implementation of the Wild and Scenic Rivers Act. Natural quiet has been removed as an Outstandingly Remarkable Value because it is not river-related nor is its presence in the corridor unique to the region or nation.

However, the removal would have a local, negligible, long-term, adverse effect on noise, since one important aspect of this environmental condition—the enjoyment of natural river sounds—has been integrated into the recreation Outstandingly Remarkable Values for each of the three applicable river segments. As such, that particular aspect would continue to be considered for both protection and enhancement. Also, for the two segments in designated Wilderness areas, noise sources would continue to be regulated through implementation of policies contained in the 1989 *Wilderness Management Plan*, such as the wilderness permit system and restrictions on aircraft and snowmobile use. Although the third river segment for which “natural quiet” would no longer be an Outstandingly Remarkable Value (below Wawona) would not be located in a designated Wilderness area, it would be designated 2A+ under this alternative; this designation would essentially eliminate the potential for noise impacts since, as undeveloped open space, new development and related noise sources would generally not be allowed.

The application of management zones under this alternative would ensure that essentially no new human-caused noise sources would be introduced along segments of the corridor that would lie in wilderness areas. Thus, Alternative 2 would have essentially no effect on the noise environment in wilderness areas.

In non-wilderness areas under this alternative, some facilities could be constructed and other facilities removed based on the new management zoning designations. Construction or demolition activities could generate substantial amounts of noise during the temporary construction period. The noise levels generated by typical pieces of construction equipment are shown in table IV-1.

At each individual construction or demolition site, the related noise impact would vary depending upon a number of factors, such as the number and types of equipment in operation on a given day, their usage rates, the level of background noise in the area, and the distance between sensitive uses and the construction site. However, in general, given the low background noise levels away from park roadways and the expectation of visitors that the environment be free of excessive noise sources (if not natural quiet), the impact from construction or demolition activities would generally be local, major, short-term, and adverse.

Best management practices are available to reduce noise impacts from equipment associated with construction or demolition activities and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. With each individual construction or demolition project, these best management practices would need to be refined and balanced against other resource goals, such as protection of wildlife. Implementation of best management practices would generally reduce the related impacts from major to moderate.

TABLE IV-1: Typical Noise Levels from Construction Equipment

<i>EQUIPMENT</i>	<i>TYPICAL NOISE LEVEL (dBA) 50 FEET FROM THE SOURCE</i>
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pneumatic Tool	85
Pump	76
Rock Drill	98
Roller	74
Saw	76
Scraper	89
Truck	88
Rock Blasting	111 to 115 *

dBA = A-weighted decibels

* Adjusted to a distance of 50 feet; original data of 107 to 111 dBA corresponds to a distance of 75 feet. Measurement of rock blasting reflects use of non-glycerin dynamite.

SOURCE: FTA 1995, except for rock blasting; rock blasting data provided by the National Park Service (Rothell 2000).

The 3C zone in Alternative 2 would accommodate the potential development of a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6. If such a facility were developed, the effect on noise would be beneficial by reducing vehicle-miles-traveled within the eastern portion of the Valley, although the immediate vicinity of the transit center and parking area itself would experience adverse effects. Once operational, noise impacts from the concentration of vehicular activity in that area would be moderate and long term. The geographic extent of adverse local noise impacts related to the transit center and/or day-visitor parking facility would depend upon the acoustical characteristics of the topography in the surrounding area (e.g., bowl or echo effects), and such characteristics should be taken into account in the development of any such facility.

The intensity of the potential beneficial effect in the eastern portion of the Valley would depend upon the types of technology used to transport visitors within the Valley. For instance, as a general matter, diesel-powered shuttle buses would generate substantially more noise than the autos they would be replacing, and the net effect of replacing autos with diesel-powered shuttle buses would depend upon the number of vehicle-miles-traveled by autos that would be displaced. However, electric shuttle buses generate substantially less noise than diesel buses, and if the National Park Service were to consider noise effects in the selection of the technology for

expanded in-Valley shuttle service (that would naturally arise from the potential development of a transit center and/or day-visitor parking facility at Taft Toe or Camp 6), then a minor to moderate, beneficial impact from the standpoint of noise levels in the eastern portion of the Valley would be expected.

If a transit center and/or day-visitor parking facility were developed at Camp 6, a traffic check station could be developed at Taft Toe. This traffic check station would result in a local, long-term, adverse effect on noise in the immediate vicinity of that station. The effect would be minor given that the same volume of traffic would pass through this area with or without the traffic check station, whether traffic proceeds eastbound or westbound. West of the station, roadside noise levels would be reduced, since eastbound traffic would decelerate in their approach to the station and since vehicles generate less noise at lower speeds. East of the station, roadside noise levels would be higher, since eastbound traffic would accelerate back to the speed limit and since accelerating vehicles generate relatively high noise levels.

Summary of Alternative 2 Impacts. Under Alternative 2, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness Management Plan*; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 2, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind.

Under Alternative 2, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Alternative 2 would also allow for the development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station), which would result in a moderate, long-term, adverse noise effect in the vicinity of the facility itself due to the concentration of vehicular activity and related noise, but would also result in a long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and their related noise. The intensity of this potential long-term, beneficial effect could be minor to moderate, depending upon the types of technology used to transport visitors within the Valley.

Cumulative Impacts

Cumulative effects to the ambient noise environment discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that

could affect noise within the river corridor or could be affected by noise sources within the corridor.

Past Actions. Development of facilities that include various sources of noise has occurred in and near some segments of the river corridor. Such facilities include roadways, campgrounds, and administrative buildings. Generally, these facilities were developed with limited consideration of potential noise impacts. From a regulatory standpoint, relevant state and federal noise standards typically apply to individual types of noise sources, such as automobiles and buses, rather than to overall noise levels, but National Park Service has adopted two plans, a Restricted Access Plan and the *Wilderness Management Plan*, that indirectly affect overall noise levels in the river corridor. The Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the indirect effect of limiting the amount of vehicle noise during peak periods by restricting the number of incoming vehicles until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The *Wilderness Management Plan* was developed to preserve a wilderness environment in which the natural world along with the processes and events that shape it are largely untouched by human interference. Implementation of the permit system for overnight camping under the *Wilderness Management Plan* reduces potential noise impacts in those areas where natural quiet is an important element of the visitor experience.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on noise. Short-term, construction-related effects include noise from heavy equipment operations. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which may have a long-term, beneficial impact by replacing automobile trips with a fewer number of transit vehicle trips, depending upon transit ridership levels and the technology used for transit vehicles.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects anticipated not to have a net adverse or net beneficial, long-term effect.

Cumulative projects that could have a net, beneficial, long-term effect on the ambient noise environment include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion.

- Passenger rail improvements in the Amtrak San Joaquin Corridor (DOT, Amtrak) and potential creation of high-speed rail service would encourage travel by alternative (nonprivate vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resources Management Building (NPS) are two projects that would reduce in-Valley vehicle trips for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Improvement Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term adverse impacts on the local noise environment primarily due to construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle noise.
- Several other regional transportation projects that would have a net beneficial effect on noise by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS), and the Expansion of Mariposa County Transit System (Mariposa Co.).
- Update to the National Park Service's 1989 *Yosemite Wilderness Management Plan*.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would therefore have a beneficial, long-term effect on the ambient noise environment.

To the extent that the transportation-related projects cited above would replace automobile trips in the Valley with bus trips, the anticipated beneficial effect would depend upon ridership levels (and the corresponding number of automobile trips that would be avoided) and the technology selected for the buses. While a bus generates higher maximum noise levels than an automobile, a shift from auto to bus trips would reduce average roadside noise levels, assuming a certain number of auto trips would be displaced. For instance, a typical diesel-powered bus generates the same amount of noise as approximately 6 to 50 typical automobiles at speeds of 40 miles per hour or less (the difference between bus and auto noise is inversely related to speed), based on data compiled by the U.S. Department of Transportation (FHWA 1995). Assuming that a typical electric bus generates approximately 6 dBA less than a typical diesel bus, an electric bus generates the same amount of noise as approximately 2 to 13 typical automobiles. Thus, these projects have the potential to contribute to a cumulative beneficial effect in the Valley, but also

have the potential to offset some of the benefit with a combination of low ridership levels and typical diesel bus technology.

Implementation of an update to the *Yosemite Wilderness Management Plan* (NPS) would have a net beneficial, long-term effect on the ambient noise environment in the Merced River corridor because of the emphasis on improving visitor use management as it relates to naturally functioning ecosystems and a quality diverse wilderness experience.

Cumulative projects that could have a net, adverse, long-term effect on the ambient noise environment include:

- Various development-related projects, such as the Mariposa County General Plan Update (Mariposa Co.); Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan
- Wawona Campground Improvement (NPS)

Cumulative growth in the region would have localized, short-term, construction-related impacts; over the long term, these projects would have an adverse effect on local roadside noise levels due to increased vehicle trips. The Wawona Campground Improvement (NPS) would construct an additional campground, which may result in increased noise in Section 35.

Reasonably foreseeable projects not anticipated to have a net adverse or beneficial effect on the ambient noise environment, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); South Fork Merced River Bridges Replacement (NPS); El Portal Road Improvement Project (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration; Bridalveil Horse Camp Rehabilitation; and Yosemite Creek Campground Rehabilitation (NPS)
- Land exchanges, such as Yosemite View Parcel Land Exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camps, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on the ambient noise environment due to construction activities, and in some cases, these effects would occur within the corridor. Over the long-term, statewide growth and development would accelerate the national trend in increased air travel, resulting in a local, minor, long-term adverse effect in some portions of the corridor in wilderness areas due to increased aircraft overflights and associated intrusive noise levels. In non-wilderness areas, cumulative actions that would provide for increased transit use and reduced automobile use or that would reduce vehicle trips in the Valley could result in a local, minor, long-term, beneficial effect within the corridor depending upon the type of technology used for transit purposes and the extent to which private automobile trips are diverted to transit.

Alternative 2 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 2 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 2; as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the cumulative actions that would tend to reduce motor vehicle trips, and the potential development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station) would result in moderate, long-term, adverse effect on noise levels in the immediate vicinities of such facilities due to the concentration of vehicular activity, but could result in a minor to moderate, long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and related noise, depending upon the type of technology used for transit purposes.

Conclusions

Under Alternative 2, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness Management Plan*; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 2, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Under Alternative 2, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Alternative 2 would also allow for the development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station), which would result in a moderate, long-term, adverse noise effect in the vicinity of the facility itself due to the concentration of vehicular activity and related noise, but would also result in a long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and their related noise. The intensity of this potential, long-term, beneficial effect could be minor to moderate, depending upon the types of technology used to transport visitors within the Valley.

Alternative 2 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 2 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term,

adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 2; as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the cumulative actions that would tend to reduce motor vehicle trips, and the potential development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station) would result in a moderate, long-term, adverse effect on noise levels in the immediate vicinities of such facilities due to the concentration of vehicular activity, but could result in a minor to moderate, long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and related noise, depending upon the type of technology used for transit purposes.

Cultural Resources

General Impacts. Cultural resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those cultural resources that are not related to the Merced River, are not unique to the region or nation, or do not accurately reflect site conditions have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, 1999 Programmatic Agreement), as well as by federal law (e.g., National Historic Preservation Act and Archeological Resources Protection Act).

Cultural resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include river-related cultural resources that are either eligible for or listed in the National Register of Historic Places that are not intended to divert the free flow of the river. The revised Outstandingly Remarkable Values are more inclusive than those in the 1996 *Draft Yosemite Valley Housing Plan* and provide greater focus on the Merced River and resources unique to the region or nation.

Archeological Resources

Analysis

Under the application of management elements for Alternative 2, there is a potential that earthmoving activities would be required as part of construction and/or development. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The proposed zoning designations for the wilderness areas of the Merced River corridor would not allow for development of any new facilities. Therefore, impacts to archeological resources would occur only as a result of ongoing park operations and programs,

such as facilities maintenance and repair. These actions have the potential to adversely affect entire sites or portions of sites by disturbing intact archeological resources, which are identified as an Outstandingly Remarkable Value. This is considered a local, long-term, minor to moderate, adverse impact, the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made to avoid adverse impacts in design. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

Yosemite Valley. The 3C zone could allow for the development of a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6. In addition, the 3B and 3C zones could allow construction of new facilities and hardened surfaces (e.g., overnight accommodations, parking areas, and park operations and maintenance) and the removal or relocation of existing facilities. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed and possibly destroyed. Although the intensity of impact would depend partly upon the nature and location of the undertaking, extensive grading and ground disturbance could result in a local, long-term, moderate to major, adverse impact to archeological resources.

The 2B, 2C, and 3A zones could allow construction of new facilities and hardened surfaces (e.g., campgrounds, trails, parking areas, restrooms, and picnic areas) and the removal or relocation of existing facilities. Development within these management zones also could concentrate visitor use at specific locations in the Valley, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. Although the intensity of impact would depend partly upon the nature and location of the undertaking, grading and ground disturbance could result in a local, long-term, minor to moderate, adverse impact to archeological resources.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, the park would conduct data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact. Every effort would be made to avoid adverse impacts wherever possible.

Merced River Gorge. Under Alternative 2, the zoning designations could allow for the construction of facilities, such as trails, parking areas, restrooms, and picnic areas, within the Merced River gorge. If construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. These

potential actions also could concentrate visitor use, thereby resulting in impacts such as trampling, surface collection, and erosion. However, by establishing a site monitoring program and by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, reducing the likelihood of visitor-related damage. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological sites would be avoided wherever possible. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

El Portal. The 3C zone could allow for the development of facilities or the removal of existing facilities. If this development or removal occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The 2C zone could allow construction of new facilities and hardened surfaces and the removal or relocation of existing facilities. Development within these management zones also could concentrate visitor use at specific locations in El Portal, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, the park would conduct data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact. Every effort would be made to avoid adverse impacts wherever possible.

Wawona. Under Alternative 2, the 3A and 3C zoning designations allow for the potential development, maintenance, rehabilitation, or removal of facilities in the Wawona area. If these activities occurred and earthmoving activities are required, intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The 2B and 2C zones could allow construction of new facilities and hardened surfaces and the removal or relocation of existing facilities. Development within these management zones also could concentrate visitor use at specific locations in Wawona, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological resources would be avoided wherever possible. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

Summary of Alternative 2 Impacts. The implementation of potential future actions in accordance with the management zones of Alternative 2 would result in a long-term, major, adverse impact to archeological resources due to the potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value. The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Cumulative Impacts

Cumulative impacts to archeological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect archeological resources within the river corridor or in the park vicinity.

Past Actions. Archeological resources are subject to damage from development, vandalism, visitor access, and natural processes. For example, the 1997 flood exposed portions of two archeological resources in El Portal.

In general, the archeological resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous archeological resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or

end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. There are archeological resource sites in Yosemite Valley, El Portal, and Wawona that are considered to be at risk from existing facility development. These sites are at or adjacent to trails, structures, utility systems, and other facilities and are subject to ongoing disturbances such as trampling, surface collection, and ground disturbance associated with facility maintenance.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on archeological resources in the vicinity include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- The *Yosemite Valley Plan* (NPS)
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- South Entrance/Mariposa Grove Site Planning (NPS)
- Resources Management Building, Yosemite West Rezoning Application, South Fork Merced River Bridges Replacement (NPS)
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS), Hazel Green Ranch (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI), Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin

(Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)

- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Merced River Canyon Trail Acquisition (BLM)

The extensive grading and ground disturbance that could be required for these projects could disturb individual archeological resources. Each of these projects is within an archeologically sensitive area, such as a river valley or a mountain meadow. Specific impacts would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected. Any disturbance of an individual archeological resource is considered to be a long-term, adverse impact.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, major, adverse impact on archeological resources.

Conclusions

The implementation of potential future actions in accordance with the management zones of Alternative 2 would result in a long-term, major, adverse impact to archeological resources due to the potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value. The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, major, adverse impact on archeological resources.

Ethnographic Resources

Analysis

Under the application of management elements for Alternative 2, there is a potential that ethnographic resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The zoning designations for wilderness areas of the Merced River corridor would not allow for the development of any new facilities. Therefore, impacts to ethnographic resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. The intensity of impact would depend on the nature, location and design of the undertaking as well as the quantity and nature of the ethnographic resources affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement and the cooperative agreement for traditional uses. Every effort would be made to avoid adverse impacts to

ethnographic sites. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impact. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Yosemite Valley. The zoning designations under Alternative 2 could allow for development of new facilities and hardened surfaces (e.g., a transit center and/or day-visitor parking facility, trails, parking areas, restrooms, and picnic areas) and removal and relocation of existing facilities. If these actions were to occur, ethnographic resources, which are identified as an Outstandingly Remarkable Value, could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected. Any such action would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. The park, in consultation with the culturally associated Indian tribes, would make every effort to avoid impacts to ethnographic resources. Where avoidance would not be possible, the park would mitigate the impact to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

The general increase in visitors to the park would increase the potential that American Indians would be discouraged from using traditional gathering areas within the Valley. However, this alternative would provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas. Compared to Alternative 1, this alternative would reduce the likelihood of impacts to ethnographic resources and would provide a long-term, minor, beneficial impact.

The River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would have a long-term, moderate, beneficial impact on ethnographic resources by improving conditions for the recovery of traditionally used plants.

Merced River Gorge. The zoning designations in the Merced River gorge could allow for construction of facilities such as trails, parking areas, restrooms, and picnic areas at the Cascades area. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this

Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

El Portal. The zoning designations for portions of the river corridor in El Portal could allow for development of new facilities, construction of other facilities (e.g., trails, parking areas, restrooms, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Wawona. The zoning designations for portions of the river corridor through Wawona could allow for ongoing maintenance and rehabilitation of facilities, construction of other facilities (e.g., trails, parking areas, restrooms, picnic areas, and new or replacement park operational facilities), and removal or relocation of existing facilities. If these actions were to occur, ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Summary of Alternative 2 Impacts. Alternative 2 could provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional

gathering areas, and the River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential future actions that could occur under the management zones of Alternative 2, which is considered to be a local, long-term, minor to major, adverse impact.

Cumulative Impacts

Cumulative impacts to ethnographic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect ethnographic resources within the river corridor or in the park vicinity.

Past Actions. Ethnographic resources and their traditional cultural associations have been lost or damaged in Yosemite National Park through past development, visitor use, natural events, and widespread disruption of cultural traditions. Nevertheless, Yosemite National Park retains many sites and resources of significance to local and culturally associated American Indians.

In general, the ethnographic resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous ethnographic resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. No present actions have been identified that would affect ethnographic resources in the vicinity of the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects that could adversely affect ethnographic resources; (2) projects that could beneficially affect ethnographic resources; and (3) projects that could either adversely or beneficially affect ethnographic resources.

Examples of projects that could have a cumulative, adverse effect on ethnographic resources include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)

- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Various development-related projects such as, the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); and Resources Management Building (NPS)
- Merced River Canyon Trail Acquisition (BLM)

All of these projects could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places. These projects would have a long-term, adverse impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were damaged and access to traditional use places were facilitated.

Reasonably foreseeable projects that would beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

These projects could result in restoring native plant habitat, which would be a long-term, beneficial impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were restored and access to traditional use places were facilitated.

Reasonably foreseeable projects that would adversely or beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- *The Yosemite Valley Plan* (NPS)

The preferred alternative of the *Yosemite Valley Plan* could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places, and could beneficially affect ethnographic resources by restoring native plant habitat.

The cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact on ethnographic resources because the long-term, beneficial impacts associated with the management of natural resources and river processes in the vicinity of the Merced River corridor would be partially offset by the long-term, adverse impacts associated with damaging gathering sites or restricting access to traditional use places.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Conclusion

Alternative 2 could provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas, and the River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential future actions that could occur under the management zones of Alternative 2, which is considered to be a local, long-term, minor to major, adverse impact.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Cultural Landscape Resources, including Historic Sites and Structures

Analysis

Under the application of management elements for Alternative 2, there is a potential that cultural landscape resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The management zoning designations for the wilderness areas of the Merced River corridor would not allow development of new facilities. Therefore, impacts to cultural landscape resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to adversely affect cultural landscape resources, which are classified as an Outstandingly Remarkable Value. Impacts would be associated with maintenance activities that remove historic fabric, remove historic structures, or add incompatible facilities within or adjacent to historic structures. The intensity of impact would depend upon the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that are affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Yosemite Valley. The Merced River, its adjacent riparian corridor and meadows, and viewsheds are considered to be important elements of the Yosemite Valley cultural landscape historic district. The management zones and the River Protection Overlay could allow for the protection and enhancement of these elements of the cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in protecting and/or enhancing the character-defining features of a historic property, and the number of contributing elements of a historic district that were protected and/or enhanced.

The management zoning designations for portions of the river corridor in Yosemite Valley could allow for the development of new facilities (e.g., a transit center and/or day-visitor parking facility, campgrounds, trails), the relocation of existing facilities, the redesign of developed areas (e.g., Yosemite Lodge, Curry Village, Yosemite Village), or the removal of facilities. Implementation of the River Protection Overlay, in combination with the management zones, would allow for the removal or redesign of bridges; however, the historic automobile and footbridges (e.g., Stoneman Bridge, Sugar Pine Bridge, Housekeeping Bridge) are considered to be Outstandingly Remarkable Values, and any future proposal for removal or redesign would be subject to the Section 7 process. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the Valleywide cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and

design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Merced River Gorge. The management zoning designations under Alternative 2 would allow for construction or removal of facilities (e.g., trails, parking areas, restrooms, Cascades residences, and picnic areas). In addition, implementation of the River Protection Overlay would allow for the removal of the Cascades Diversion Dam. If such construction or removal activities were to occur, then cultural landscape resources could be adversely affected by removing resources or by adding incompatible facilities within or adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected. These actions would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts prove impossible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

El Portal. The management zoning designations for the river corridor in El Portal could allow for construction of facilities (e.g., trails, parking areas, restrooms, park operational facilities, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then cultural landscape resources could be adversely affected by removing historic structures or by adding incompatible facilities adjacent to historic resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Wawona. The zoning designations in the river corridor in Wawona could allow for construction of facilities (e.g., trails, parking areas, restrooms, and picnic areas) and removal or relocation of existing facilities. If these actions were to occur, then cultural landscape resources could be adversely affected by removing or altering historic fabric, removing historic structures, or by adding incompatible facilities within or adjacent to cultural landscape resources. Since the intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of

contributing elements of a historic district that are affected, it is not possible to determine the intensities of these impacts. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Summary of Alternative 2 Impacts. The zoning designations and River Protection Overlay could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning designations and the River Protection Overlay could allow for the development of new facilities, the relocation or removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Cumulative Impacts

Cumulative impacts to cultural landscape resources discussed herein are based on analysis of the effects of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect cultural landscape resources within the river corridor or in the park vicinity.

Past Actions. Cultural landscape resources have been lost or damaged in Yosemite through past development, visitor use, and natural events. In wilderness areas, cultural landscape resources include remnants of early stock grazing, trails, and work camps. In Yosemite Valley, Wawona and El Portal, cultural landscape resources include early hotels, bridges, stores, studios, cabins, farms, and railroad structures that were associated with early Euro-American pioneer settlement and industries. In the Merced River gorge, cultural landscape resources include segments of the early wagon road and engineering projects. Rapidly disappearing structures and sites in other areas include homestead cabins, barns, road and trail segments, bridges, mining complexes, railroad and logging facilities, blazes, and campsites. These resources are reminders of the area's ranching, grazing, lumbering, and mining history.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within

the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects cultural landscape resources within the Merced River gorge. Cultural landscape resources are protected during construction by implementation of a compliance monitoring program.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could affect cultural landscape resources include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Wawona Campground, Tamarack Campground Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS)
- The *Yosemite Valley Plan* (NPS)
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Yosemite View parcel land exchange, El Portal (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- The Update to the *Yosemite Wilderness Management Plan* (NPS)
- Several water improvement projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Merced River Canyon Trail Acquisition (BLM)
- The update to the *Yosemite Fire Management Plan* (NPS)

Given that each of these actions could result in removal of historic fabric or resources, add noncontributing elements to the historic cultural landscape, or add incompatible facilities within or adjacent to a cultural landscape resource, these cumulative projects would have a long-term, adverse impact on cultural landscape resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

Conclusion

The zoning designations and River Protection Overlay could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning designations and the River Protection Overlay could allow for the development of new facilities, the relocation or

removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

National Historic Preservation Act Section 106 Summary

Under regulations of the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800.9) that address the criteria of effect and adverse effect, the zoning designations and River Overlay Protection proposed under this alternative would allow (but do not prescribe) actions that have the potential to adversely affect significant properties. The National Park Service has determined that selection of this alternative would result in “no effect” to historic properties listed in or eligible for listing in the National Register of Historic Places. The California State Historic Preservation Officer has concurred with this determination.

Visitor Experience

Analysis

General Impacts. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those recreation resources that are not related to the Merced River (e.g., rock climbing) or not unique to the region or nation (e.g., rainbow trout fishing) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan* and *Resources Management Plan*), as well as by federal law (e.g., the National Park Service Organic Act). Recreation Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) include activities such as river-related hiking, picnicking, and opportunities for solitude and enjoyment of natural river sounds and the scenery of riverine habitats, such as riparian forests, meadows, and the aquatic environment.

The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*. Alternative 2 management zoning, in combination with the implementation of Visitor Experience and Resource Protection (VERP) proposed under this alternative (refer to discussions of specific areas below), would provide increased protection for these Outstandingly Remarkable Values compared to the absence of zoning in the No Action Alternative.

Implementation of the VERP framework would have an overall beneficial impact on all recreation Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is designed to protect and enhance the quality of the visitor experience. Over the long term, implementation of VERP could have a beneficial impact on visitor experience because it would protect the visitor experience from adverse impacts associated with visitor use.

For example, if the number of encounters along a segment of trail were selected as an indicator of desired visitor experience, violation of the standard associated with this indicator would result in management action to manage or limit visitor use in the area. The management action could be to redirect some visitors to trails where the standard is not being violated, or to reduce the frequency of shuttle bus stops at the trailhead. This action would have a beneficial impact by discontinuing further visual and ecological degradation of the trail segment and thus protecting the future enjoyment of the trail.

Implementation of the VERP framework would manage visitor use in the Merced River corridor in Yosemite National Park. Because the management actions necessary to protect the visitor experience and natural resources are unknown, and it is uncertain how protecting the visitor experience and resources would specifically affect visitor experience in the Merced River corridor, analysis of the impacts of implementation of VERP on overall Yosemite visitation, and thus the accessibility to recreational opportunities, the wilderness interpretation and orientation facilities, or visitor services, would be speculative. Before new management action were taken, a determination would be made as to whether preparation of environmental documentation to comply with the provisions of the National Environmental Policy Act or other applicable legislation would be required to assess the effects of this action on the environment – including visitor experience opportunities.

Recreation

Analysis

The following discussion provides an overview of the types of impacts to recreation resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The zoning is not anticipated to alter the recreational experience or use patterns of these areas compared to the No Action Alternative. Access to an organized camping experience

in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Consequently, the application of management zoning within wilderness segments would have no effect on the recreation experience within the wilderness.

Outstandingly Remarkable Values within wilderness segments include opportunities for solitude along the river with primitive and unconfined river-related recreation (e.g., day hiking, backpacking, fishing, horseback riding and packing, camping, and enjoyment of natural river sounds). Effects to recreation-related Outstandingly Remarkable Values within wilderness portions of the Merced River are considered beneficial under this alternative, because the proposed management zoning would protect the quality of recreational opportunities while precluding new development that could reduce this quality or its availability.

Impacts in Yosemite Valley. Recreation Outstandingly Remarkable Values of Yosemite Valley include opportunities to experience a spectrum of river-related recreational activities, from nature study and sightseeing to hiking. Yosemite Valley is one of the premier outdoor recreation areas in the world. Effects to recreation-related Outstandingly Remarkable Values within Yosemite Valley are considered beneficial under this alternative, because the proposed zoning would protect the quality of recreational opportunities while precluding new development that could reduce these opportunities or their availability.

The proposed zoning under Alternative 2 would alter recreational use of Yosemite Valley compared to Alternative 1. Recreational zoning protects the diversity of recreational experiences along the length of Yosemite Valley – from opportunities for solitude, group activities, challenge, and access. This protected access to diverse experiences would result in a beneficial, long-term impact.

The 2B zoning over much of west Yosemite Valley could restrict some uses in the immediate vicinity of the Merced River. Some recreation would be directed toward areas better able to withstand heavy use without adverse effects on the river's natural processes. For example, the launching of non-motorized watercraft in Yosemite Valley could be limited to certain areas (e.g., Sentinel Beach and Cathedral Beach, zoned 2C). Likewise, present high use of El Capitan Meadow (zoned 2B) and along Southside Drive near Bridalveil Fall would be inconsistent with the proposed management zoning and would be redirected toward areas such as the proposed picnic area at the base of El Capitan (zoned 2C).

In general, river access could be available on a less independent basis than at present, and could be more directed and controlled in an attempt to minimize effects on sensitive areas within the corridor that are currently not protected. There would be a likely reduction of access by personal motor vehicles (but potential greater access by bicycles) to recreational opportunities west of Sentinel Beach in Yosemite Valley (except at higher-use areas such as picnic areas, the Cascades, and Bridalveil Fall). Management zones could allow protection and restoration efforts to take place in certain areas within the corridor, particularly in Day Use and Attraction zones in the east Valley. Essentially, the intent is to manage the park to allow the maximum amount of resource-

based recreation, while at the same time protecting the unique natural resources that contribute to the overall visitor experience.

Under Alternative 2, the majority of recreational opportunities would continue to be available (e.g., swimming and wading, hiking, backpacking, rock climbing, fishing, sightseeing, photography, nature study, bicycling, and private stock use), but could potentially be limited in some zones as a result of VERP monitoring and management actions. The trail system would remain unaffected by zoning but could require adjustment over time as a result of VERP management actions. The concession-run stable in Yosemite Valley would be inconsistent, as the zoning is for Camping (zone 3A) under this alternative.

The use of non-motorized watercraft (e.g., inner tubes, rafts, kayaks) would be affected by zoning. The ability to launch and remove a raft, for example, could be limited to certain points along the Merced River in an effort to direct use to less sensitive areas and allow for some restoration. The overall quantity of rafting itself, or the use of other non-motorized watercraft, would not be limited under this alternative.

Management zoning prescriptions under Alternative 2 allow for day-use areas within the corridor that could support more active and intensive recreational activities (in terms of more people and heavier use), such as swimming and picnicking, than would be allowed in other zones within the corridor. As a result, certain areas in Yosemite Valley would likely become more crowded. These areas include Sentinel Beach, Cathedral Beach, and Devils Elbow. At the same time, management zoning would discourage use of other areas that are currently accessible to large groups of visitors. Though it is not possible to quantify the effect, the characteristics and the quality of the recreational opportunities that would take place in those locations (e.g., between Sentinel Beach and Pohono Bridge) would be altered. For example, the concentration of swimmers in certain parts of the river would lead to a more social experience for those visitors, rather than an independent or solitary one. Additionally, the spontaneity of visitors' recreational experiences, relative to swimming, fishing, picnicking, nature study, and photography, would be reduced.

The effects of Alternative 2 zoning on camping or lodging in Yosemite Valley are analyzed in Visitor Services.

Impacts in the Merced River Gorge and El Portal. Management zoning prescriptions under Alternative 2 would not alter access to areas along the Merced River currently used for recreation, nor preclude any of the existing recreational activities in the gorge or El Portal. In fact, zoning prescriptions for undeveloped lands in El Portal could allow for greater intensity of use. In El Portal, visitors swim at Patty's Hole and near the sand pit. Fishermen access the river from the sand pit, as well as between Patty's Hole and the sand pit. These areas would generally not be affected. As a result, some visitors displaced from other zones within the corridor could use this area. These changes could reduce opportunities for finding solitude and quiet. Additionally, the potential development of specific locations (e.g., the Middle Road area) could shift some use to other areas in El Portal.

Outstandingly Remarkable Values within the gorge and El Portal include a range of river-related recreational opportunities, in particular white-water rafting and kayaking (class III to V), fishing,

picnicking, photography, and sightseeing. Effects to recreation-related Outstandingly Remarkable Values within these segments of the Merced River are considered beneficial under this alternative, because the proposed zoning would protect the range of recreational opportunities while precluding new development that could reduce this range of opportunities or its availability.

Impacts in Wawona. Alternative 2 zoning prescriptions for the Wawona area would allow many recreational opportunities similar to existing use patterns, but would alter some uses. The trail system would remain unaffected by zoning but could require adjustment over time as a result of VERP monitoring and implementation of VERP management actions.

The concession-run stable in Wawona could not remain in operation, as the existing use would be inconsistent with management zoning prescriptions. The stable could, however, be relocated outside of the management zone. Therefore, this is considered to be a short-term, negligible, adverse effect.

The effects of Alternative 2 zoning on camping in Wawona are analyzed in this section under the heading “Visitor Services.”

Outstandingly Remarkable Values within Wawona include opportunities to experience a spectrum of river-related recreational activities, from nature study and photography to hiking. Effects to recreation-related Outstandingly Remarkable Values within Wawona are considered beneficial under this alternative, because the proposed zoning would protect the range of recreational opportunities while precluding new development that could reduce this range of opportunities or its availability.

Summary of Alternative 2 Impacts. Alternative 2 could have either a beneficial or adverse impact on visitor experience as it relates to access to and availability of recreational opportunities, because of changes in the character and accessibility of recreational opportunities in the river corridor. The implementation of potential future actions in accordance with the management zones of Alternative 2 is considered to be either a long-term, minor, beneficial impact or a long-term, negligible, adverse impact, depending on the viewpoint of the recreational user. The quality of the recreational experience could improve because of improved quality of the environment. However, the availability and access to certain areas may could be restricted, which would be a local, long-term, negligible, adverse impact.

Cumulative Impacts

Cumulative impacts on visitor experience as it relates to recreation are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified include only those that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the

formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions would have a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities (e.g., restrooms) that mitigate adverse effects associated with visitor use.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on visitor experience. Short-term, construction-related effects include travel delay and closure of the area to recreational use. Those effects are mitigated by implementation of a traffic control plan with measures such as strict construction timing restrictions, roadway safety procedures, and the use of flaggers, and signals. Long-term effects are improved access to recreational opportunities along the river corridor and El Portal Road, and easier, more dependable, and safer access for recreational vehicles, buses, and other vehicles to Yosemite Valley and other park destinations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both adverse and beneficial effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to recreation include:

- The Yosemite Area Regional Transportation System (YARTS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River Canyon Trail Acquisition (BLM)

These projects would provide increased access for visitors to the park and expand recreational opportunities in the vicinity of the park.

Reasonably foreseeable projects that could have both adverse and beneficial impacts include:

- The *Yosemite Valley Plan* (NPS)
- The Update to the *Yosemite Wilderness Management Plan* (NPS)

These projects have the potential to enhance the quality of the visitor experience in the wilderness and Yosemite Valley but also could result in the removal of existing recreational facilities. For example, the *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could be considered a local, long-term, adverse impact to some users, due to the loss of a unique lodging experience in the wilderness. This action could also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness, a reduction in stock impacts, improvements in scenic and

natural quiet, and improvements in opportunities for solitude and a primitive and unconfined recreational experience.

Reasonably foreseeable projects that could have a net adverse effect on visitor experience include:

- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); Hazel Green Ranch (Mariposa Co.); and the Yosemite West Rezoning Application (NPS)

These projects could increase visitor use in the park and in the river corridor and could contribute to increased congestion and reduce the quality of specific, solitude-based recreational opportunities in the park.

The cumulative projects would have a long-term, negligible, beneficial impact, because the beneficial impacts associated with increased visitor access and expanded recreational opportunities would be partially offset by the adverse impacts associated with the removal of specific recreational opportunities.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, beneficial impact on recreation, because an increase in visitor access, an expansion of recreational opportunities, and improved quality of the natural environment would only be partially offset by the removal of specific recreational opportunities.

Conclusions

Alternative 2 could have either a beneficial or adverse impact on visitor experience as it relates to access to and availability of recreational opportunities, because of changes in the character and accessibility of recreational opportunities in the river corridor. The implementation of potential future actions in accordance with the management zones of Alternative 2 is considered to be either a long-term, minor, beneficial impact or a long-term, negligible, adverse impact, depending on the viewpoint of the recreational user. The quality of the recreational experience could improve because of improved quality of the environment. However, the availability and access to certain areas could be restricted, which would be a local, long-term, negligible, adverse impact.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, beneficial impact on recreation, because an increase in visitor access, an expansion of recreational opportunities, and improved quality of the natural environment would only be partially offset by the removal of specific recreational opportunities.

Interpretation & Orientation

Analysis

The following discussion provides an overview of the types of impacts to interpretation and orientation that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter interpretation or orientation of these areas compared to the No Action Alternative. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue as currently managed. There would be no impact compared to Alternative 1.

Impacts in Yosemite Valley. Under Alternative 2, the availability and diversity of interpretation, orientation, education, and information services within Yosemite Valley could change. This ability to provide a full range of interpretive programs and services could be limited as a result of management zoning, which would direct visitor access to particular areas along the river and away from sensitive areas to reduce the impacts of visitor use. The 2B zone would allow mainly for self-interpretation between Sentinel Beach (zone 2C) and Cathedral Beach (zone 2C), while other management zoning prescriptions (the 2C zone) would allow for ranger-led walks and talks in east Yosemite Valley. Amphitheater programs could continue at Lower Pines Campground.

Also, management zoning prescriptions under this alternative would allow for the construction of a transit center and/or day-visitor parking facility at Taft Toe or Camp 6 (zone 3C). Zoning in this area would allow for the construction of facilities to assist in avoiding or minimizing impacts on sensitive resources.

If a transit center and/or day-visitor parking facility at Taft Toe or Camp 6 were constructed, access to an associated visitor center, if incorporated, would greatly improve. Visitors to Yosemite Valley and the corridor would be able to receive both orientation and interpretation at a easily located, accessible facility. Interpretive programs and services currently offered by the park partners and the primary concessioner would continue throughout the Merced River corridor; however, flexibility of programs, such as group numbers or kind of programs offered at some locations, could be limited to reduce impacts of high visitor use at sensitive or impacted locations.

Impacts in the Merced River Gorge and El Portal. There are no interpretive programs currently offered in the gorge or El Portal. Under Alternative 2, this condition would not change (compared to Alternative 1). The application of management zoning proposed under Alternative 2 would not affect existing interpretive signs and exhibits. There would be no impact compared to Alternative 1.

Impacts in Wawona. The proposed zoning of Wawona is not anticipated to alter interpretation or orientation of these areas compared to Alternative 1. Under Alternative 2, the Pioneer Yosemite

History Center in Wawona would continue as currently managed and would not be relocated out of the corridor. Amphitheater programs could continue at Wawona Campground. Interpretive programs and services offered by the park partners and the primary concessioner would continue as currently managed throughout the Merced River corridor. There would be no impact compared to Alternative 1.

Summary of Alternative 2 Impacts. Alternative 2 could have either a long-term, negligible to minor, adverse impact on interpretation and orientation in the river corridor (e.g., because the types and access to interpretation and orientation programs and services could be more limited and directed to particular areas than at present) or a long-term, negligible to minor, beneficial impact (e.g., because access to orientation and interpretation at a potentially relocated visitor center would be improved).

Cumulative Impacts

Cumulative effects on visitor experience as it relates to orientation and interpretation are based on analysis of past and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect visitor interpretation and orientation within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under the jurisdiction of these agencies. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to orientation and interpretation include:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)

These projects could enhance the quality of the visitor experience by expanding interpretation and orientation services in Yosemite Valley and Wawona.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The Update to the *Yosemite Wilderness Management Plan* (NPS)

This planning effort could prescribe the closure of the Merced Lake High Sierra Camp. The potential discontinuation of visitor use of the Merced Lake High Sierra Camp would disrupt the High Sierra Camp loop-trip experience and the ranger-led interpretive hikes in the wilderness. On the other hand, this could result in a beneficial effect for other user groups who would benefit from a reduction in facilities in the wilderness and enhanced opportunities for solitude and self-guided interpretive experiences.

The cumulative projects would have a long-term, minor, beneficial impact, because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by the potential loss of ranger-led hikes in the wilderness.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, beneficial impact on interpretation and orientation, because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by programs and services being more limited and directed to particular areas pursuant to Alternative 2 and the potential loss of ranger-led hikes in the wilderness.

Conclusions

Alternative 2 could have either a long-term, negligible to minor, adverse impact on interpretation and orientation in the river corridor (e.g., because the types and access to interpretation and orientation programs and services could be more limited and directed to particular areas than at present) or a long-term, negligible to minor, beneficial impact (e.g., because access to orientation and interpretation at a potentially relocated visitor center would be improved).

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, beneficial impact on interpretation and orientation, because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by programs and services being more limited and directed to particular areas pursuant to Alternative 2 and the potential loss of ranger-led hikes in the wilderness.

Visitor Services

Analysis

The following discussion provides an overview of the types of impacts to visitor services that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter visitor services within these areas compared to the No Action Alternative. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) and lodging at the Merced Lake High Sierra Camp would not change under this alternative. In addition, visitors could still establish independent

camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue.

Impacts in Yosemite Valley. Alternative 2 management zoning prescribes levels of recreational use and related facilities that vary from existing use patterns. Overall, the availability and diversity of visitor services could change from what is currently available to the visitor in Yosemite Valley. Demand for visitor services, including camping and lodging, are currently unmet in the summer months, though food and retail services are able to meet visitor demand.

During peak summer months, Camp 4 (Sunnyside Campground), North Pines Campground, Upper Pines Campground, and Lower Pines Campground are typically full. In addition, Housekeeping Camp, Yosemite Lodge, and Curry Village are also full during peak summer months (Yosemite Lodge is at capacity year-round). The park's inability to meet demand in Yosemite Valley was exacerbated by the damage sustained during the 1997 flood. Campsites that were closed as a result (e.g., Upper River and Lower River Campgrounds) would not be reopened. Some units at Yosemite Lodge were also removed due to flood damage and would not be replaced. Under this alternative, Housekeeping Camp could be redesigned, which could include the removal of some units, because these units would be in the River Protection Overlay.

Zoning under Alternative 2 could allow for expansion of campsites at North Pines Campground and Upper Pines Campground. Yellow Pine Campground (zone 3A/3C), which is currently used for volunteers only, could also become walk-in or car campsites, or its current use could be continued.

Alternative 2 could perpetuate the inability to meet visitor demand for camping and lodging accommodations during the summer months, if additional accommodations were not built. The number of camping units could increase, decrease, or stay the same under this alternative. If the number of park campsites and lodging units were to increase under Alternative 2, there would be a local, long-term, minor, beneficial impact on visitor experience, because of the potential for a slight increase in the park's ability to meet demand for overnight camping and lodging. If the number of campsites and lodging units were to stay the same, there would be a local, long-term, minor, adverse impact on visitor experience, as this would perpetuate the park's inability to meet demand. If the number of campsites and lodging units were to decrease, there would be a local, long-term, moderate, adverse impact on visitor experience, because the inability of the park to meet demand would worsen over time.

The National Park Service, park partners, and the primary park concessioner would continue to operate food service and retail outlets in Yosemite Valley and thus would continue to meet demand. Therefore, no impacts associated with these aspects of visitor experience would occur.

Impacts in the Merced River Gorge and El Portal Visitor. There are no visitor services currently offered in the gorge; those services available in El Portal are mostly run by private businesses (e.g., lodging, restaurants, etc.) and would not be affected by Alternative 2.

Impacts in Wawona. During peak summer months, Wawona Campground and the Wawona Hotel are typically full. Approximately one-third of the campsites at Wawona Campground would be located within the River Protection Overlay and could be relocated or removed. This would further exacerbate the park's ability to meet demand in Wawona, especially during peak summer months. Additional campsites could be built in the 3A/3C zone in Section 35 in Wawona outside the corridor. If the number of park campsites were to increase under Alternative 2, there would be a local, long-term, minor, beneficial impact on visitor experience, because of the potential for a slight increase in the park's ability to meet demand for overnight camping. If the number of campsites were to decrease, there would be a local, long-term, moderate, adverse impact on visitor experience, because the inability of the park to meet demand would worsen over time.

Summary of Alternative 2 Impacts. Alternative 2 could have either a local, long-term, minor, beneficial or moderate, adverse impact on visitor services, depending upon implementation of potential future actions in accordance with the management zones. If the number of park campsites and lodging units were to increase under Alternative 2, there would be a local, long-term, minor, beneficial impact on visitor experience because of the potential for a slight increase in the park's ability to meet demand for camping and lodging. If the number of campsites and lodging units were to stay the same, there would be a local, long-term, minor, adverse impact on visitor experience, as this would perpetuate the park's inability to meet demand. If the number of campsites and lodging units were to decrease, there would be a local, long-term, moderate, adverse impact on visitor experience, because the inability of the park to meet demand would worsen over time.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. Upper and Lower River Campgrounds and part of Lower Pines Campground were closed following damage sustained during the 1997 flood. This resulted in a decrease in the overall number of campsites available to visitors in the Valley. Similarly, lodging units at the Yosemite Lodge were removed as a result of flood damage and have not been replaced.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Examples of projects that could have a cumulative, beneficial effect on visitor services include:

- The Yosemite Area Regional Transportation System (YARTS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)

- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Garrotte Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); and the Yosemite West Rezoning Application (NPS)

These projects could improve transportation to and from the park, which would ultimately have a beneficial effect on visitor services by providing increased access for visitors staying outside the park. In addition, the number of campsites and lodging units in the park and in the park vicinity could increase, which would improve visitor services for park visitors.

Reasonably foreseeable projects that could have a net adverse effect on visitor services include:

- The Update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. This change could affect the ability to meet the lodging demand in the corridor and park and could be considered an adverse impact, due to the loss of a unique lodging experience in the wilderness.

Examples of projects that could have a cumulative mixed effect on visitor services include:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* proposes restoration of degraded areas and a reduction of development within the Merced River ecosystem while enhancing the quality of the visitor experience in Yosemite Valley. Visitor services could be improved by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The *Yosemite Valley Plan*, however, would prescribe a reduction in camping and lodging units in Yosemite Valley, which would have an adverse effect on the provision of visitor services.

These cumulative projects would have a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park. The potential for overnight accommodation facilities to be maintained, reduced, or increased in the Valley, as described in Alternative 2 would be clarified by the actions proposed in the *Yosemite Valley Plan*.

Conclusions

Alternative 2 could have either a local, long-term, minor, beneficial or moderate, adverse impact on visitor services, depending upon implementation of potential future actions in accordance with the management zones. If the number of park campsites and lodging units were to increase under Alternative 2, there would be a local, long-term, minor, beneficial impact on visitor experience because of the potential for a slight increase in the park's ability to meet demand for camping and lodging. If the number of campsites and lodging units were to stay the same, there would be a local, long-term, minor, adverse impact on visitor experience, as this would perpetuate the park's inability to meet demand. If the number of campsites and lodging units were to decrease, there would be a local, long-term, moderate, adverse impact on visitor experience, because the inability of the park to meet demand would worsen over time.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park. The potential for overnight accommodation facilities to be maintained, reduced, or increased in the Valley, as described in Alternative 2 would be clarified by the actions proposed in the *Yosemite Valley Plan*.

Wilderness Experience

Analysis

The following discussion provides an overview of the types of impacts to the wilderness experience that could occur within the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Under Alternative 2, management zone prescriptions applied to wilderness areas within the Merced River corridor reflect existing conditions. The wilderness zones include trailed areas with heavy use, trailed areas with light use, and untrailed areas. Most visitors experience the wilderness area by foot, though there is a small percentage of stock use. Heavy Use Trails (zone 1C), particularly en route to the wilderness via Little Yosemite Valley, provide the least opportunity for solitude, as encounters with other visitors are likely to be frequent. In the Trailed Travel zones (1B), visitor encounters would be infrequent, except at key trail junctions and camping areas (e.g., near Merced Lake High Sierra Camp). In the Untrailed zones (1A), there would be a very high potential for solitude and primitive camping experiences due to the remoteness of the area.

Management zoning prescriptions under this alternative would not change access to the wilderness or access to backpackers campgrounds in the wilderness.

Overall, access to the wilderness within the Merced River corridor would continue to be managed under the current wilderness permit system, and primitive camping and opportunities for solitude would remain available. At present, the park is able to accommodate visitor requests for

wilderness permits parkwide, although demand specifically for access to the upper reaches of the Merced River corridor (particularly in Little Yosemite Valley) exceeds the availability of wilderness permits as controlled by the quota system. This condition would likely continue under Alternative 2 in order to maintain the management direction that visitors have the ability to experience solitude and engage in a primitive camping experience in the wilderness.

Summary of Alternative 2 Impacts. The wilderness experience under Alternative 2 would be the same as that for Alternative 1. Therefore, this is considered to have no impact under Alternative 2.

Cumulative Impacts

Cumulative effects on the wilderness experience are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect the wilderness experience within the river corridor or in the park vicinity.

Past Actions. The wilderness permit/trailhead quota system, established in 1974-1976 set limits for the numbers of people allowed to enter the wilderness per day per trailhead. These limits were based on extensive research and monitoring to assess capacity based on ecological and social considerations, and were in response to exceptionally high levels of use in the early- to mid-1970s. This system has had beneficial impacts on the wilderness experience through implementation of a quota system to protect natural resources.

Present Actions. The wilderness permit/trailhead quota system continues to limit and/or disperse use based on trailhead access, and thus provides the beneficial impact of improved experience of natural values due to resource protection.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to wilderness experience include:

- Several planning or restoration efforts are in various stages of development, including the *Fire Management Plan* (NPS); the *Fire Management Action Plan for Wilderness* (USFS); the Sierra Nevada Framework for Conservation and Collaboration (USFS); Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); the Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus); the Tuolumne Meadows Development Concept Plan (NPS); and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Merced Canyon River Trail Acquisition (BLM).

These projects could result in the restoration of wilderness areas within the park and in the park vicinity. Any improvement to the wilderness ecosystem is considered to be a long-term, beneficial impact.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The Update to the *Yosemite Wilderness Management Plan* (NPS);

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could affect the ability to meet lodging demand and would impact some users due to the loss of a unique lodging experience in the wilderness. In addition, the potential discontinuation of visitor use of the High Sierra Camps would eliminate the High Sierra Camp loop-trip experience. On the other hand, this action might also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness and a reduction in stock impacts. These individuals could benefit from improvements in scenic and natural quiet qualities, opportunities for solitude, and an overall primitive recreational experience.

These cumulative projects would have a long-term, minor, beneficial impact on the wilderness experience, because the wilderness ecosystem would be improved and would only be partially offset by the long-term, adverse impact of removing the High Sierra Camps.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Conclusions

The wilderness experience under Alternative 2 would be the same as that for Alternative 1. Therefore, this is considered to have no impact under Alternative 2.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Social Resources

Land Use

Analysis

General Impacts. Under the management zones for Alternative 2, expansion and/or development of uses and facilities within the river corridor could occur, altering the intensity of the use of a specific site. However, the basic land use designation of Yosemite National Park (i.e., public parklands) would not change under Alternative 2, and National Park Service policy concerning the acquisition of private lands within or adjacent to the park is compatible with current plans and policies and would not change under Alternative 2; therefore, there would be no land-use impacts on parklands or other properties within or adjacent to the park.

Private property within the river corridor in El Portal and Wawona is not zoned under the *Merced River Plan*. Management zones in the *Merced River Plan* would not result in conflicts with existing land uses or existing plans and policies and would not induce changes in those land uses.

Section 8 of the Wild and Scenic Rivers Act withdraws lands within the boundaries of Wild and Scenic Rivers from “public entry, sale, or disposition under the public land laws, of the United States.” This section of the Wild and Scenic Rivers Act preempts public land laws such as the 1872 General Mining Act, under which nonreserved public lands may be disposed of for private use. However, because Yosemite National Park is by definition “reserved land,” no additional lands have been identified for withdrawal under the *Merced River Plan*. Furthermore, much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772).

In accordance with Section 9 of the Wild and Scenic Rivers Act, lands within one-quarter mile of the main stem and South Fork of the Merced River have been withdrawn from all forms of appropriation under mining and mineral leasing laws of the United States. Because much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772), no additional lands have been identified for withdrawal under the *Merced River Plan*.

Summary of Alternative 2 Impacts. Under Alternative 2, the adoption of management zoning is considered to be a short-term, minor, beneficial impact. Since the basic land use of the park would not change, no impacts to land uses would occur as a result of Alternative 2.

Cumulative Impacts

Cumulative impacts to land use discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect land use within the river corridor and in the immediate vicinity of Yosemite National Park.

Past Actions. In general, land uses in the Merced River corridor have been determined by past decisions on the development, relocation, and removal of specific facilities. Development within the Merced River corridor has occurred since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) does not affect the land uses within the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that are anticipated to change overall land uses can be separated into local and regional projects. Local projects (i.e., those within the Park and involving parklands) being carried out under the direction of the National Park Service include:

- The *Yosemite Valley Plan*, the Yosemite View parcel land exchange, El Portal; South Entrance/Mariposa Grove Site Planning; Resources Management Building; Yosemite West Rezoning Application; Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan; Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and Crane Flat Campus Redevelopment (NPS, YNI)
- Several Yosemite campground rehabilitation projects include Tamarack Campground, Bridalveil Horse Camp, Yosemite Creek Campground, Hodgdon Meadows Campground, and the Wawona Campground Improvement (NPS)

Local projects have the potential to change land uses within the park. For example, the *Yosemite Valley Plan* could change existing land uses and the intensity of existing land uses within portions of the Merced River corridor in Yosemite Valley as well as in El Portal and Wawona. These changes to land uses would be dictated by the development plans outlined in the *Yosemite Valley Plan*.

Another example of a local project is the land exchange between the National Park Service and the owner of a parcel of private property near the park's western entrance at the El Portal Administrative Site. The owner of the private parcel would receive a plot of National Park Service land adjacent to the owner's hotel properties in exchange for the landowner's plot two miles west of the Arch Rock Entrance Station. This land exchange would allow the National Park Service to construct facilities, such as a vehicle turnaround area, that would increase the vehicle handling efficiency of the entrance station. The U.S. Congress has passed legislation allowing this land exchange to occur, but it is not yet completed. Though completion of the land exchange would alter the land use for those two plots of land, the overall effect would be negligible, because the two plots of land are close together and there would be no net change in the amount of each type of land use in the area. A similar land exchange would also take place in Wawona. The Seventh Day Adventist recreational camp is located in Wawona on privately owned land inside the boundaries of Yosemite National Park. The privately owned land occupied by the camp literally abuts portions of Yosemite's designated Wilderness. To protect designated Wilderness this project would exchange lands between the National Park Service and the Seventh Day Adventist camp.

Regional projects (those that take place outside of the park) that would affect land use and planning within the Yosemite region and are not under National Park Service jurisdiction include:

- Projects undertaken by county governments include: Hazel Green Ranch (Mariposa Co.); Mariposa County General Plan Update (Mariposa Co.); Yosemite Motels, El Portal (Mariposa Co.); Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); Buildout of the City of Merced, General Plan (City of Merced); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility

(Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); and Evergreen Road Improvements (multi-agency, see Appendix G)

- Projects undertaken by federal agencies include: South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM); Sierra Nevada Framework for Conservation and Collaboration (USFS); and Merced River Canyon Trail Acquisition (BLM)

Regional projects have the ability to alter land use in the park vicinity. An example of such a project would be the Mariposa County General Plan Update, which is scheduled to begin in 2000. Although the plan does not explicitly call for land use changes, it does provide general guidance for land use, zoning, and development throughout Mariposa County, which could likely impact land use in the long term.

Another regional project that could affect land use is the *South Fork and Merced Wild and Scenic River Implementation Plan*. This plan covers management of lands along river segments including: a 15-mile portion of the main stem extending from the El Portal Administrative Site to a point 300 feet upstream of the confluence with Bear Creek; a 21-mile segment of the South Fork from the park boundary to the confluence of the Merced River; and a 3-mile segment of the South Fork just upstream of Wawona, where the National Park Service has jurisdiction over the north side of the river and the U.S. Forest Service has jurisdiction over the south side. The plan calls for the long-term protection of natural and cultural resources, and managing the area for the use and enjoyment of visitors in a way that will leave the resource unimpaired for future use and enjoyment as a natural setting.

The impact intensity of planning projects would depend upon the extent to which the plan's recommendations were implemented. Land uses would most likely shift in various areas. The short-term impacts on land use would be neither adverse nor beneficial; likewise, long-term impacts on land use would be neither an adverse nor beneficial.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Conclusions

Since the basic land use designation would not change, no impacts to land uses would occur as a result of Alternative 2.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Transportation

Analysis

General Impacts. The following discussion provides an overview of the types of transportation impacts that could occur within the Merced River corridor from application of Alternative 2.

Under the application of management zones for Alternative 2, there is a potential that the number of overnight accommodation facilities in the park (campsites or lodging) could be increased, maintained, or reduced from that under Alternative 1. An increase or decrease in these facilities would shift the mix of park overnight visitors and day visitors (i.e., more or fewer visitors would be able to stay overnight in the park, respectively). An example of a potential increase in overnight accommodation facilities under Alternative 2 involves the areas adjacent to Upper Pines Campground and Camp 4 (Sunnyside Campground), which do not currently have camping uses but would be zoned 3A and could be converted to camping. In addition, an area in Section 35 in Wawona that does not currently have camping use would be zoned 3A/3C and could be developed for camping use. If the overall number of camping accommodations increased compared to the No Action Alternative, then the number of park overnighers would increase. This would result in less regional traffic (entering and leaving the park) because the additional park overnighers would not need to make two trips per day between their out-of-park accommodations and attractions within the park. This would have a long-term, negligible, beneficial impact on traffic conditions at park entrances by negligibly decreasing delays experienced by queues of backed-up vehicles.

An example of a potential decrease in overnight accommodations under Alternative 2 involves application of the River Protection Overlay, which could result in the removal of some overnight accommodation facilities (e.g., a portion of Housekeeping Camp in Yosemite Valley and a portion of the Wawona Campground). If those facilities were relocated from within the River Protection Overlay to locations elsewhere in the park, then the current mix of park overnighers and day visitors would be maintained, and there would be no change to traffic conditions from those under Alternative 1. If, however, the above-described overnight accommodation facilities were removed from the River Protection Overlay and not relocated elsewhere in the park, then the number of park overnighers would decrease, and more regional traffic (entering and leaving the park) and local traffic within the park would be generated, and more local traffic could be generated within Yosemite Valley. An overall reduction of overnight accommodation facilities in the park would cause visitors who otherwise (under Alternative 1) would stay overnight in the park to use campsites and/or lodging outside the park (i.e., to become day visitors, or more precisely, local overnighers). That shift to higher numbers of local overnighers would increase the amount of traffic entering and leaving the park, because visitors would need to make two trips per day between their out-of-park accommodations and attractions within the park. This would have a long-term, negligible, adverse impact on traffic conditions at park entrances and on the majority of park roadways (i.e., outside of Yosemite Valley, including in Wawona and El Portal) by negligibly increasing delays experienced by queues of backed-up vehicles, and negligibly increasing congestion and delays experienced by drivers on roadways outside of the Valley.

The effect on local traffic conditions within Yosemite Valley would depend on whether a transit center and/or day-visitor parking facility were developed at either Taft Toe or Camp 6 as a result of the 3C zone. If a transit center and/or day-visitor parking facility were developed, then local traffic congestion in the east Valley would be reduced. Day visitors (i.e., those visitors without reservations for overnight accommodations in Yosemite Valley) would be intercepted at a traffic check station on Southside Drive near the El Capitan crossover and would be directed to the transit center and/or day-visitor parking facility (at either Taft Toe or Camp 6). Day visitors then would move between destinations in the Valley by shuttle bus, bicycle, or on foot. If a transit center and day-visitor parking facility were established at Taft Toe, then the number of private vehicles entering the more-congested east Valley would be greatly reduced, which would yield a major benefit. Siting this facility at Camp 6 would reduce the number of vehicles once the day-visitor vehicles intercepted at the traffic check station reached Camp 6; however, the reduction would be less than if this facility were sited at Taft Toe, because private vehicles could be used in a larger area of the Valley before reaching Camp 6. Creation of a transit center and/or day-visitor parking facility would offset increases in local traffic generated by an increase in the number of local overnights that would occur if overnight accommodation facilities in the park were removed (see above). Shifting visitors (local overnights and day visitors) from their private vehicles to Valley shuttle buses would have a long-term, moderate, beneficial (if at Camp 6) or major, beneficial (if at Taft Toe) impact on traffic conditions in the east Valley by moderately (or exceptionally) reducing congestion and delays experienced by drivers.

Also as a result of the application of the management zoning, parking spaces inconsistent with the 2B zone could be removed from the Merced River corridor. If those spaces were removed and not relocated elsewhere, then more traffic congestion would be generated within the park, because visitors unable to find an authorized place to park would circle around, increasing traffic volumes at congested locations. This would have a long-term, negligible, adverse impact on traffic conditions in Yosemite Valley by negligibly increasing congestion and delays experienced by drivers. If parking spaces were relocated to other areas in the river corridor with a 3C zone designation (e.g., a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6 in Yosemite Valley), the relocated spaces would reduce the above-described adverse effects of removing parking spaces within the river corridor. In addition, if a transit center and/or day-visitor parking facility were not built at either Taft Toe or Camp 6, parking spaces removed from within the river corridor could be relocated to outside the corridor (e.g., near Yosemite Village), which also would reduce the adverse effects of removing parking within the river corridor. It also is assumed that the Restricted Access Plan would continue to be implemented during peak-season periods when criteria for implementation were met.

Additionally, if parking spaces were removed and not relocated elsewhere (as described above), then conflicts between vehicles would potentially increase, because visitors unable to find an authorized space could decide to park in unauthorized/improper areas. This would have a long-term, negligible, adverse impact on traffic safety conditions by negligibly increasing the potential for traffic safety hazards.

Under Alternative 2, the River Protection Overlay could result in the removal of vehicle bridges over the Merced River, altering the circulation patterns of vehicles (private, regional public transit, Valley shuttle, etc.). This would have a long-term, moderate, adverse impact on traffic

conditions in Yosemite Valley by moderately increasing traffic volumes on the remaining bridges (and roadways used to access those bridges). Creation of a transit center and/or day-visitor parking facility (see above) would likely lower traffic volumes on roadways in the Valley enough to reduce the effect of bridge removal to a negligible-to-minor, adverse impact (i.e., negligibly to slightly increasing traffic volumes on the bridges that remain and on roadways used to access those remaining bridges).

Summary of Alternative 2 Impacts. The implementation of potential future actions in accordance with the management zones of Alternative 2 is considered to be either a long-term, negligible, beneficial impact or a long-term, negligible, adverse impact, depending on whether an increase or a decrease in overnight accommodations within the river corridor occurred, whether a transit center and/or day-visitor parking facility were developed, and whether parking spaces within the 2B zone were removed.

Cumulative Impacts

Cumulative transportation effects discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect access and transportation in the vicinity of the river corridor.

Past Actions. Development of a circulation system that includes roadways, parking areas, and bridges has occurred within and in the vicinity of Yosemite National Park. This circulation system was developed to provide access to the park and the surrounding areas. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles until the traffic volume and parking demand in the Valley decreases sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on transportation. Short-term, construction-related effects include visitor delays and visitor hazards through the construction work zone. Those effects are mitigated by implementation of a traffic control plan, with measures such as strict construction timing restrictions, roadway safety procedures, flaggers, and signalling. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which would be a long-term, beneficial impact.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have adverse effects.

Reasonably foreseeable projects that could have a cumulative, long-term, beneficial effect on regional transportation include the following:

- The Yosemite Area Regional Transportation System (YARTS)
- San Joaquin Corridor Rail Projects (DOT, Amtrak)

- The Yosemite West Rezoning Application (NPS)
- The *Yosemite Valley Plan* (NPS)

The aforementioned projects, individually and in combination, would reduce congestion by encouraging travel to the park by alternative (non-private vehicle) modes. For example, YARTS is a collaborative, multi-agency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion. The initial YARTS service would be a demonstration project (scheduled to begin by early summer 2000), with a target market of visitors staying overnight in the gateway communities and employees working at Yosemite National Park who live in the gateway communities. A successful YARTS would reduce the number of day visitors arriving in private vehicles. Similarly, the Yosemite West Rezoning Application would include a provision for a regional staging area to provide visitor parking and linkage to regional public transportation systems. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. The circulation pattern in Yosemite Valley would be changed by the removal of roads from Ahwahnee and Stoneman Meadows, the removal of parking from Curry Orchard, the conversion of Northside Drive to a multi-use (bicycle and pedestrian) paved trail from El Capitan crossover to Yosemite Lodge, and the conversion of Southside Drive to two-way traffic between El Capitan crossover and Curry Village. The implementation of these projects would result in a reduction in automobile congestion within Yosemite Valley. In addition, parking lots(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.

Reasonably foreseeable projects that could have a short-term, adverse effect but a cumulative, long-term, beneficial effect on regional transportation include:

- Highway 41 Extension (Madera Co.)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.)
- Mariposa Creek Pedestrian/Bike Path (Mariposa Co.)
- Evergreen Road Improvements (multi-agency, see Appendix G)

Although the above projects would have site-specific and short-term, adverse effects (e.g., construction-related transportation effects), the general goal of these projects is to improve regional transportation circulation and safety.

Reasonably foreseeable projects that could have a short-term adverse effect on regional transportation include:

- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects and the A-Rock Reforestation (USFS, Stanislaus); and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrote Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); Crane Flat Campus Redevelopment (NPS, YNI); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and the Resources Management Building (NPS)

The adverse effects associated with the above projects would be short term in nature, primarily related to construction-generated traffic on roadways serving the project sites. These projects would not result in any net, long-term effects to regional transportation.

Given the potential for a reduction in the number of day visitors arriving in private vehicles, these cumulative projects would have a long-term, minor to moderate, beneficial impact on the regional transportation system. The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented. The short-term, construction-related traffic impacts that would occur from development of site-specific projects would not appreciably alter these long-term, beneficial impacts.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to moderate, beneficial impact on traffic and traffic safety conditions in Yosemite National Park, because these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would manage traffic and parking to reduce congestion. The intensity of the impact depends on the implementation of various projects that would benefit the transportation system.

Conclusions

The implementation of potential future actions in accordance with the management zones of Alternative 2 is considered to be either a long-term, negligible, beneficial impact or a long-term, negligible, adverse impact, depending on whether an increase or a decrease in overnight accommodations within the river corridor occurred, whether a transit center and/or day-visitor parking facility were developed, and whether parking spaces within the 2B zone were removed.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to moderate, beneficial impact on traffic and traffic safety conditions in Yosemite National Park because these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would manage traffic and parking to reduce congestion. The intensity of the impact depends on the implementation of various projects that would benefit the transportation system.

Scenic Resources

Analysis

General Impacts. Scenic Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River or not unique to the region or nation have been removed (e.g., the confluence of tributaries in Wawona, magnificent views of Triple Divide Peak and the Sierra Crest within the wilderness segment of the South Fork). Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan* and *Resources Management Plan*), as well as by federal law (e.g., the 1916 Organic Act). Scenic Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) are now focussed on spectacular views from the river and its banks. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Implementation of the Visitor Experience and Resource Protection (VERP) framework would have a local, long-term, minor, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is intended to institutionalize an ongoing adaptive management program in which park staff would continuously monitor visitors and resources, identify discrepancies between existing and desired visitor experiences and resource conditions, and take action to achieve desired conditions. If monitoring determined that desired visitor experiences and resource conditions were not being met in a particular management zone, management sub-zone, or segment, then management actions could be undertaken. An example of a management action that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leafed trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This would likely open previously closed views and improve the texture and lighting of the foreground of any landscape viewable from the Merced River corridor.

The following discussion provides an overview of the types of impacts to scenic resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., management zoning, the River Protection Overlay, the VERP framework).

Impacts in the Wilderness. Scenic Outstandingly Remarkable Values of the wilderness include views from the Merced River and its banks of the exposed bedrock riverbed, Merced Lake and Washburn Lake, the Bunnell Cascades, the confluence of tributaries, a large concentration of granite domes, and the Clark and Cathedral Ranges. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (as prescribed by zones 1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness reaches of the Merced River, these management elements would limit the type of new facilities (e.g., campsites with facilities are prohibited in the 1B zone) that could be built in the Merced River corridor. This would limit potential adverse effects on scenic resources associated with disruption of native vegetation or placement of facilities in undeveloped areas. The application of management zoning and the River Protection Overlay within wilderness segments would have a local, long-term, negligible, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in Yosemite Valley. Under Alternative 2, the total number of overnight accommodations in the park (campsites or structured lodging, zones 3A or 3B) could be decreased, increased, or unchanged compared to the No Action Alternative. Application of the River Protection Overlay under Alternative 2 could result in the removal of some Housekeeping Camp units, but other areas of Yosemite Valley would be zoned to allow development of new campsites. Depending on the level of development of new sites, the total number of overnight accommodations in Yosemite Valley could increase, remain the same, or decrease. Also, this alternative would not preclude relocating facilities from the Merced River corridor to other areas of the park. While this would likely have a beneficial impact on scenic resources within or viewable from the corridor, the relocation could have an adverse impact on scenic resources in their new location.

Decreasing the total number of overnight accommodations in Yosemite Valley would likely have a local, long-term, minor, beneficial effect on scenic resources within the Merced River corridor. Removal of overnight accommodations would reduce the amount of developed area in the corridor and, if restored to natural conditions, would increase restoration of naturally vegetated areas.

Conversely, if the total number of accommodations within Yosemite Valley were to increase, this would have local, long-term, minor, adverse impact on scenic resources within the Merced River corridor. Increasing overnight accommodations would increase the amount of developed area in the corridor and would decrease the amount of naturally vegetated areas in the Valley.

Alternative 2 also would allow for the creation of a transit center and/or day-visitor parking facility at Taft Toe or Camp 6 (zone 3C) in Yosemite Valley. The development at either Taft Toe or Camp 6 would have an adverse effect on scenic resources in the Valley, due to the intrusion of the new structures into the visual landscape, including the introduction of new transportation-related facilities and the reflective glare and visual intrusion of parked vehicles at these locations. The extent of the adverse impact would depend on the design of the new facility and the degree to which it would be visible from traditionally valuable viewpoints within the Merced River corridor. The adverse visual effects of a transit center/day-visitor parking facilities would be

somewhat offset by beneficial effects, including a decrease of vehicle traffic in Yosemite Valley by increasing the movement of visitors via mass transit (i.e., shuttle buses). This could decrease the frequency of vehicle intrusions into views of the landscape. The net adverse effects of the development at Taft Toe or Camp 6 could be mitigated to a local, long-term, negligible to minor, adverse impact on scenic resources by implementation of mitigation measures described in Chapter II, under Mitigation Measures Common to All Action Alternatives.

The proposed 2C zoning over much of east Yosemite Valley and the 2B zoning in west Yosemite Valley are more restrictive in terms of permitted visitor uses and facilities than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, an important component of the scenic environment within the Valley. For example, the visual character of El Capitan Meadow is degraded by visitor use due to trampling, soil compaction, and fragmentation. The current visitor-intensive use of El Capitan Meadow would be inconsistent with the 2B zoning, which is characterized by relatively quiet natural areas where visitor encounters would be low to moderate. Application of the 2B zoning prescriptions and implementation of VERP could result in management actions that would redirect use away from sensitive areas such as El Capitan Meadow and initiate restoration of the meadow. These management actions would have a local, long-term, minor, beneficial impact on the scenic quality of the meadow.

Application of the River Protection Overlay could have both beneficial and adverse effects on scenic resources within Yosemite Valley. Adverse effects on scenic resources could occur if implementation of the River Protection Overlay resulted in the removal of a historic bridge. This could adversely affect scenic resources within the Merced River corridor due to the loss of an aesthetically pleasing component of the scenic landscape. Beneficial effects on scenic resources from implementation of the River Protection Overlay could include removal of facilities (e.g., portions of Housekeeping Camp) that intrude upon the natural character of the corridor, which would increase opportunities for natural revegetation and restoration of the river corridor. The net effect of the River Protection Overlay would be a local, long-term, minor, beneficial impact on scenic resources, since the opportunities to increase natural vegetation and restoration of the river corridor would offset the adverse effects on scenic resources associated with possible removal of aesthetically pleasing historic bridges.

The intensity of potential impacts to scenic resources caused by Alternative 2 would be directly related to the effectiveness of methods employed in the park to reduce human-caused erosion within the river corridor and to reduce crowding at popular viewpoints. The VERP framework would monitor visitor use and its effects on scenic resources and scenic Outstandingly Remarkable Values. Facilities such as boardwalks and fences could be used to route people away from sensitive natural resources, while still permitting access to important viewpoints. Signs could be used to promote an understanding among park visitors of how to avoid harm to natural communities and features, though any physical facilities constructed to manage the impact of people on scenic resources should be designed for minimal disturbance of and visual intrusion into the natural landscape.

Scenic Outstandingly Remarkable Values within Yosemite Valley include views from the Merced River and its banks of waterfalls and water features (Nevada, Vernal, Illilouette, Yosemite,

Sentinel, Ribbon, and Bridalveil Falls, and Silver Strand), rock cliffs (Half Dome, North Dome/Washington Column, Glacier Point, Yosemite Point/Lost Arrow Spire, Sentinel Rock, Three Brothers, Cathedral Rocks, and El Capitan), and meadows (Stoneman, Ahwahnee, Cook's, Sentinel, Leidig, El Capitan, and Bridalveil). There is a scenic interface of river, rock, meadow, and forest throughout the segment. Alternative 2 would protect and enhance the scenic Outstandingly Remarkable Values through the application of extensive 2B and 2C management zoning in the Valley, the River Protection Overlay, and VERP. These management elements would place restrictions on new development and would encourage restoration activities. An example of a restoration activity that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leafed trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This would likely open views of scenic Outstandingly Remarkable Values from the Merced River corridor. Application of these management elements and implementation of VERP would have a local, long-term, minor, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in the Merced River Gorge and El Portal. The majority of the Merced River gorge would have a quarter-mile boundary, be zoned 2A+, 2A, and 2B, and would receive increased protection over the absence of zoning under the No Action Alternative. Extensive use of 2A+, 2A, and 2B zoning in the gorge would substantially limit areas where new development could occur. Management zoning would ensure that the natural appearance of the gorge would be maintained, which would have a local, long-term, negligible, beneficial impact on scenic resources.

Scenic Outstandingly Remarkable Values of the Merced River gorge include views from the Merced River and its banks of the Cascades, spectacular rapids among giant boulders, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock. The extensive application of 2A+, 2A, and 2B zoning and the quarter-mile boundary over a majority of the Merced River gorge would protect and enhance these Outstandingly Remarkable Values. Management zoning in the gorge would substantially limit areas where new development could occur and would maintain the natural appearance of the gorge, ensuring the protection of the scenic Outstandingly Remarkable Values.

Portions of El Portal would be zoned 3C (e.g., the Trailer Village, Old El Portal), which could allow additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site). Such development could have local, long-term, minor, adverse effects on the scenic character of the Merced River corridor in El Portal. Adverse effects could be mitigated by implementing mitigation measures described in Chapter II under Mitigation Measures Common to All Action Alternatives. The adverse impact on scenic resources in El Portal could be further offset by the potential restoration of the sand pit. The current park operations-related use of the sand pit would be inconsistent with the proposed 2C zoning, and the sand pit could be restored to a natural condition, which would have a beneficial effect on scenic resources at this location.

Impacts in the South Fork. The upper and lower portions of the South Fork would be zoned 1A, 1B, and 2A+. The majority of the South Fork through Wawona would be zoned 2A, 2B, and 3C.

The 1A, 1B, 2A+, 2A, and 2B management zoning would increase protection over the absence of zoning under the No Action Alternative. Application of these zones along the South Fork would substantially limit areas where new development could occur. The 1A, 1B, 2A+, 2A, and 2B management zones would ensure that the natural appearance of these areas of the South Fork would be maintained, which would have a local, long-term, minor, beneficial impact on scenic resources.

Substantial portions of the Wawona area would be zoned 3C. These areas include existing developments, such as the Wawona Hotel, the wastewater treatment plant and maintenance area, and residential and commercial areas in Section 35. An area on the south side of the river in Section 35 would be zoned 3A/3C that currently has only limited development. Naturally vegetated and undeveloped areas in the 3A/3C zoned area of Section 35 could be developed with camping or housing uses. If such development were to occur, this would have a local, long-term, minor, adverse effect on scenic resources in Wawona, due to the visual intrusion of new development in areas that are currently undeveloped. This impact would be minor, because much of Section 35 is currently developed with similar uses.

Portions of features adjacent to the South Fork, such as Wawona Campground and the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated, thereby increasing opportunities for natural revegetation and restoration. Should these areas within the River Protection Overlay be restored, this would have a local, long-term, minor, beneficial impact on scenic resources in these areas.

Scenic Outstandingly Remarkable Values of the South Fork include views from the Merced River and its banks of large pothole pools within slick rock cascades, old growth forest, and meadows, Wawona Dome, and continual white-water cascades in the deep and narrow river canyon below Wawona. Alternative 2 would protect and enhance the scenic Outstandingly Remarkable Values through the application of 1A, 1B, 2A+, 2A, and 2B management zoning along the South Fork, the River Protection Overlay, and VERP. These management elements would place restrictions on new development and would encourage restoration activities. Should VERP monitoring reveal degradation of riparian vegetation due to visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the resource and management zone. Such management elements would protect scenic Outstandingly Remarkable Values, including views from the river and its banks of unique features, and would have a local, long-term, minor, beneficial effect on scenic resources.

Summary of Alternative 2 Impacts. Generally, application of management zoning, the River Protection Overlay, and VERP would have a local, long-term, minor, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley and Wawona due to opportunities to restore degraded areas of the Merced River corridor, remove developments inconsistent with the River Protection Overlay, and to implement management actions to maintain desired resource conditions pursuant to VERP. This beneficial impact would be partially offset by management zoning that allows for certain new developments to occur, such as a transit center in Yosemite Valley and camping or housing in Section 35 in Wawona. In designated Wilderness, the impacts would be negligible and beneficial, because scenic resources in Wilderness would experience somewhat perceptible improvements compared to Alternative 1. In

the gorge and El Portal, this alternative would have a negligible, beneficial impact on scenic resources by ensuring the natural appearance of the gorge would be maintained, and due to the potential for restoration in El Portal; this beneficial impact could be partially offset by the potential for new development in El Portal.

Cumulative Impacts

Cumulative impacts to scenic resources discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect scenic resources within the river corridor or in the immediate park vicinity.

Past Actions. Scenic resources have been affected by numerous past actions since the inception of the park. Primary among these, when considered in relation to the potential effects of the *Merced River Plan*, is the alteration of natural communities caused by Euro-American settlers who lived in the park. For example, attempts to establish agricultural activities and the development of tourism resulted in the drying out of the Valley by breaching the moraine and controlling naturally occurring fires, which affected vegetation patterns along the Merced River. Broad-leafed trees along the river banks were replaced by the comparatively dense stands of conifers that exist today. This has had a local, long-term, adverse effect on scenic resources, as the conifers now block views of important scenic resources that were viewable before the vegetation patterns were changed.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor, and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Projects that could have a cumulative beneficial effect on scenic resources include those that could reduce the number of vehicles entering the park, and therefore the frequency of intrusion of vehicles into the scenic landscape. Projects that improve the general health of ecosystems viewable from or within the Merced River corridor also would result in a net cumulative, beneficial effect on scenic resources. Examples of these types of projects are:

- The Yosemite Area Regional Transportation System (YARTS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS).

- Update to the *Yosemite Fire Management Plan* (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams, Dinkey Lakes, and Monarch Wildernesses (USFS)

The general goal of these projects is to either reduce private vehicle traffic in the park, and especially in Yosemite Valley (which would reduce the frequency of vehicles intruding into important scenic resources viewable within or from the Merced River corridor), or to improve the health of ecosystems that make up parts of important scenic resources, either in the park or on lands adjacent to the park. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and restoring natural vegetation. These cumulative projects would have a net long-term, beneficial impact on scenic resources.

Reasonably foreseeable projects that could have an adverse effect on scenic resources include:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Yosemite View parcel land exchange, El Portal (NPS)

The local, long-term, adverse effects of these reasonably foreseeable projects would be related to the potential introduction of new structures and/or infrastructure that would intrude into views of important scenic resources within or viewable from the Merced River corridor. For example, the Yosemite View parcel land exchange could result in new development in an area of El Portal that is currently undeveloped and reduce in the vegetative screening of the existing motel complex. This project would result in increased views of developed structures on the banks of the Merced River from Highway 140.

Reasonably foreseeable projects that could have a mixed effect on scenic resources include:

- The *Yosemite Valley Plan* (NPS)
- Wawona Campground Improvement (NPS)

The *Yosemite Valley Plan* would have a local, long-term, beneficial impact on scenic resources in the Valley due to restoration of disturbed or developed land to natural conditions and, in particular, large-scale restoration of areas within the A-scenic category (areas considered to have the most significant scenic views within the Valley). The *Yosemite Valley Plan* also would include areas of new development in the Valley (largely consolidated in the east Valley), Wawona, and El Portal, resulting in adverse impacts due to visual intrusions in the scenic landscape. However, impacts in these areas contribute directly to the improvement of the scenery within the Valley by removing facilities and restoring impacted areas.

The Wawona Campground Improvement project would have a local, long-term, beneficial impact on scenic resources due to restoration activities to improve the existing degraded campground, including activities to revegetate the riverbanks. Some aspects of the campground improvement

project could have adverse effects on scenic resources due to new development in undeveloped areas, such as the proposal to construct an additional campground in Section 35.

These past and reasonably foreseeable future actions could have a net local, long-term, major, beneficial cumulative effect on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems, and reducing the number of vehicles. Scenic resources in the Wilderness segments would experience local, long-term, negligible, beneficial cumulative impacts due to the reduction of site-specific erosion and trampling and restoration of natural vegetation. In some developed areas in Wawona and El Portal, the cumulative projects would result in local, long-term, minor, adverse cumulative impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, major, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning and the River Protection Overlay in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial, because scenic resources in Wilderness areas would experience somewhat detectable improvements compared to Alternative 1. In some developed areas in Wawona and El Portal, Alternative 2 and the cumulative projects would result in local, long-term, minor, adverse impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley; these adverse impacts have been partially offset by the potential for restoration in these communities pursuant to the management elements of Alternative 2.

Conclusions

Generally, application of management zoning, the River Protection Overlay, and VERP would have a local, long-term, minor, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley and Wawona due to opportunities to restore degraded areas of the Merced River corridor, remove developments inconsistent with the River Protection Overlay, and to implement management actions to maintain desired resource conditions pursuant to VERP. This beneficial impact would be partially offset by management zoning that allows for certain new developments to occur, such as a transit center in Yosemite Valley and camping or housing in Section 35 in Wawona. In designated Wilderness, the impacts would be negligible and beneficial, because scenic resources in Wilderness would experience somewhat perceptible improvements compared to Alternative 1. In the gorge and El Portal, this alternative would have a negligible, beneficial impact on scenic resources by ensuring the natural appearance of the gorge be maintained and due to the potential for restoration in El Portal; this beneficial impact would be partially offset by the potential for new development in El Portal.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, major, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural

conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning and the River Protection Overlay in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial, because scenic resources in the Wilderness would experience detectable improvements compared to Alternative 1. In some developed areas in Wawona and El Portal, Alternative 2 and the cumulative projects would result in local, long-term, minor, adverse impacts to scenic resources due to visual intrusions into the scenic landscape from new development, such as facilities being relocated from Yosemite Valley; these adverse impacts would be partially offset by the potential for restoration in these communities under the management elements of Alternative 2.

Socioeconomics

Social Environment

Analysis

General Impacts. Under the application of management zones for Alternative 2, a number of employee residences could possibly be displaced in Yosemite Valley. The Valley stable and primary park concession employee residences at the Valley stable would be inconsistent with the 3A zoning prescription and could be relocated from the corridor to another area of the Valley or could be removed from the park altogether. If the Valley stable were relocated elsewhere in the Valley, then the employee residences at the stable would likely be relocated to the El Portal Administrative Site; the possible displacement of these residences is analyzed below. If the Valley stable were removed from the park, the stable would no longer operate; these employee residences would no longer be needed and would not be replaced elsewhere in the park or in the El Portal Administrative Site.

Under Alternative 2, the Yellow Pine Campground would be zoned 3A/3C such that the area could be used as a volunteer campground or a visitor campground. If volunteer camping were replaced by visitor camping, volunteer camping could be relocated elsewhere in the Valley, resulting in no net loss of volunteer camping compared to the No Action Alternative. If volunteer camping were replaced by visitor camping, and this use were not relocated elsewhere, there would be a net loss of volunteer camping in the Valley.

In Section 35 in Wawona, a nominal number of park-owned residences are located within the Merced River corridor and River Protection Overlay and would be inconsistent with the 2B zoning prescription and River Protection Overlay applied to that area. Under Alternative 2, these employee residences could be removed or relocated to other sites within Wawona, resulting in the displacement of the residents.

The possible reduction or relocation in employee housing of Yosemite Valley and Wawona could be offset by the potential ability to develop employee housing in El Portal or Wawona (in areas with 3C or 3A/3C zoning prescriptions, or areas outside the river corridor). In addition, the potential new housing in El Portal or Wawona would likely be of better quality than the present employee quarters.

Employee commuting distances and costs would increase if employee housing were relocated from Yosemite Valley and Wawona to El Portal or some other location. Yosemite Valley employees, for example, would experience an hour commute each day from El Portal, and Wawona employees would experience an approximately two-hour daily commute.

The possible reduction or relocation of employee housing and associated effects on employee commutes would constitute a long-term, negligible, adverse impact on the local social environments of Yosemite Valley and Wawona, because only a small number of employee residences in these communities would be affected, and the impact could be offset by the possibility of developing replacement housing in El Portal or Wawona. In both Yosemite Valley and Wawona, less than 5% of government-owned housing would be affected. Eligible residents who might be effected by actions of this plan, and who meet the compensation criteria under provisions of the Uniform Relocation Act, may be eligible for housing and moving benefits, although this would not be expected to lower the intensity of the impact.

Although it is unknown where the displaced employee housing would be relocated, some or all of the housing units could be located in El Portal or Wawona. The social environment in El Portal and Wawona could experience long-term, negligible to minor, adverse impacts because less than 5% of housing would be affected and there would be limited impacts on community amenities from relocation of displaced employee housing to these communities. The intensity of the impact would depend on the number of new residents relocated to these areas.

Summary of Alternative 2 Impacts. The possible reduction or relocation of employee housing and associated effects on employee commutes would constitute a long-term, negligible, adverse impact on the local social environments of Yosemite Valley and Wawona, because only a small number of employee residences in these communities would be affected, and the impact could be offset by the possibility of developing replacement housing in El Portal or Wawona. The social environments in El Portal and Wawona would experience long-term, negligible to minor, adverse impacts associated with the strain on limited community amenities from the potential relocation of displaced employee housing to these communities.

Cumulative Impacts. Cumulative effects on the social environment discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to this environmental discipline.

Past Actions. A substantial number of concession beds were damaged by the 1997 flood and were subsequently removed. The majority of the removed concession beds were replaced with temporary beds for concession employees, although not all of the beds were replaced, which resulted in a net loss of concessioner housing in Yosemite Valley. The loss of housing and the replacement of permanent housing with temporary housing has had a local, long-term, adverse effect on the social environment of Yosemite Valley.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net

beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the social environment include:

- Yosemite Area Regional Transportation System (YARTS)
- Merced River Canyon Trail Acquisition (BLM)

Implementation of YARTS would provide additional transportation options for employees and community residents. YARTS could somewhat improve the commuting conditions of employees by providing regional transportation alternatives for those employees resulting in a regional, long-term, beneficial impact on employee commutes.

The Bureau of Land Management's Merced River Canyon Trail Acquisition would allow for the development of a recreational trail west of the El Portal Administrative Site. This project would somewhat improve community amenities in El Portal, resulting in a local, long-term, beneficial impact on the social environment of El Portal.

A reasonably foreseeable future project that could have an adverse effect on the social environment includes:

- The Yosemite View parcel land exchange, El Portal (NPS)

The Yosemite View parcel land exchange would somewhat reduce the amount of open space available to the community of El Portal, although the proposed motel development would incorporate a public trail system and limited nature/river interpretive areas. This project would result in a local, long-term, adverse impact to the social environment of El Portal. This would result from the strain on limited community amenities in El Portal, loss of open space, and the opportunity cost of removing the National Park Service Parkline land from consideration for other community needs.

A reasonably foreseeable future project that could have a mixed effect on the social environment includes:

- *The Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would remove substantial amounts of employee housing from Yosemite Valley, and would construct new employee housing in El Portal and Wawona, among other locations. Redesigned housing in Yosemite Valley and new housing in El Portal and Wawona would substantially improve the quality of housing in these communities. The social environment in Yosemite Valley would experience local, long-term, beneficial effects associated with reduced crowding, more secure housing conditions, and increased privacy. The social environment of the workforce would experience local, long-term, adverse effects associated with increases in commuting time, change of housing locale, and a decrease in social amenities near housing sites. For the Yosemite Valley workforce, the adverse effects may be so severe that they would no longer be willing to work in the Valley and may leave the area. The social environment in El Portal and Wawona would experience local, long-term, adverse effects due to substantial

increases in housing in these communities, although it is expected that the projected population growth would be gradual. Even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal, there could be substantial strains on the limited community amenities of El Portal as employees transition from Yosemite Valley.

The cumulative projects would have a regional, long-term, negligible, beneficial impact on employee commuting conditions due to the provision of regional transportation alternatives. The cumulative projects would have a local, long-term, moderate to major, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal). The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residences could be relocated under Alternative 2 by providing regional transportation alternatives for those employees. Alternative 2 and the cumulative projects would have a local, long-term, moderate to major, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal). The impact intensity would depend upon the extent that the cumulative projects' recommendations are implemented.

Conclusions. The possible reduction or relocation of employee housing and associated effects on employee commutes would constitute a long-term, negligible, adverse impact on the local social environments of Yosemite Valley and Wawona, because only a small number of employee residences in these communities would be affected, and the impact could be offset by the possibility of developing replacement housing in El Portal or Wawona. The social environments in El Portal and Wawona would experience long-term, negligible to minor, adverse impacts associated with the strain on limited community amenities from the potential relocation of displaced employee housing to these communities.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residences could be relocated under Alternative 2 by providing regional transportation alternatives for those employees. Alternative 2 and the cumulative projects would have a local, long-term, moderate to major, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan*

calls for the placement of community amenities in El Portal). The impact intensity would depend upon the extent that the cumulative projects' recommendations are implemented.

Visitor Populations

Analysis

General Impacts. Under the application of management zones for Alternative 2, the Valley stable would be zoned 3A and could be developed as camping. Areas adjacent to Upper Pines and North Pines Campgrounds that do not currently have camping uses would be zoned 3A and could be converted to camping. An area northeast of Camp 4 (Sunnyside Campground) that is currently undeveloped would be zoned 3A/3B and could be developed with camping or lodging uses. As mentioned above, Yellow Pine Campground (zoned 3A/3C) could be used as volunteer camping or visitor camping. Although the majority of Housekeeping Camp would be located in a compatible 3B zone, a small number of lodging units would be within the River Protection Overlay, and those units could be relocated from the corridor or removed from the park altogether. In Section 35 in Wawona, an area would be zoned 3A/3C that does not currently have camping uses, and could be developed as camping. At the Wawona Campground, approximately one-third of the campsites would be located within the River Protection Overlay and could be relocated from the corridor or removed from the park. Overall, the zoning prescriptions would allow for the addition of some camping areas, and the reduction of some camping and lodging (Housekeeping Camp) areas. The zoning prescriptions could result in no net change in park accommodations, a decrease in park accommodations, or an increase in park accommodations. It is expected, however, that any net change in in-park accommodations would be relatively low, given the application of management zones under this alternative. A decrease or increase in these facilities would shift the mix of park overnights and day visitors. It is assumed that the total number of annual visitors would be the same as under Alternative 1.

Should the overnight accommodation facilities that are inconsistent with the management zone prescriptions be relocated from the Merced River corridor to elsewhere in the park, there would be no net loss of park accommodations. The composition of the Yosemite visitor population (the ratio of park overnights to day visitors) and visitor spending would not differ from Alternative 1.

Should the overnight accommodation facilities that are inconsistent with the management zone prescriptions be removed from the park altogether, the total number of in-park accommodations would decrease. There would likely be a shift in the Yosemite visitor population such that there would be a decrease in park overnights and an increase in day visitors. This would further exacerbate the unmet demand for park accommodations described under Alternative 1. Day-visitor parking facilities could be provided at Taft Toe or Camp 6 under this alternative (see the discussion in the Transportation section of this document). The shift in the Yosemite visitor population would constitute a long-term, minor, adverse impact on park overnight visitors due to the permanent decrease in park overnight accommodations. The decrease in park accommodations would not represent a substantial change as compared to total park accommodations and would be expected to be slightly detectable. This would be a local impact.

It is expected that displaced park overnighers would stay in gateway communities. In the short term, some visitors that wish to lodge overnight in the region could become day visitors due to a lack of lodging capacity, particularly during the peak season. In the long-term, however, the regional lodging market would respond to visitor demand, and displaced day visitors could become local overnighers.

As with Alternative 1, no changes in Yosemite visitor spending behavior would be expected. No major changes are proposed that would alter the types of goods and services available to visitors. Zoning prescriptions under this alternative would not exclude or attract any different visitor groups or appreciably change the character of the “average” Yosemite visitor. Therefore, visitor spending patterns and estimates based on the 1998 YARTS survey are appropriate for use in estimating future visitor spending behavior. Based on the YARTS visitor survey, local overnighers generally spend more than park overnighers during their trip, who in turn generally spend more than day visitors (see table III-20 in Chapter III, Affected Environment). Compared to Alternative 1, it is expected in the short term that visitor spending would decrease slightly, because former park overnighers would become day visitors. In the long run, however, visitor spending would increase, because former park overnighers would become local overnighers. Impacts to the regional economy associated with changes in visitor spending are discussed below under the heading “Regional Economy.”

Should the total number of in-park accommodations increase in the Merced River corridor, there would likely be a shift in the Yosemite visitor population. There would be an increase in park overnighers and a decrease in day visitors, particularly local overnighers who are more likely than day visitors to wish to lodge in the park. This would somewhat reduce the unmet demand for park accommodations described under Alternative 1. The shift in the Yosemite visitor population would constitute a long-term, minor, beneficial impact on park visitors due to the permanent increase in overnight accommodations. The increase in park accommodations would not represent a substantial change as compared to total park accommodations and would be expected to be slightly detectable. This would be a local impact.

Visitor spending would decrease somewhat, because former local overnighers would likely select to stay in the park, spending less per capita on average than local overnighers, based on the 1998 YARTS survey. Impacts to the regional economy associated with changes in visitor spending are discussed below under the heading Regional Economy.

Impacts on Low-Income Populations. Potential impacts on low-income populations that visit the park are related primarily to the availability and cost of overnight accommodations, and the range of available low-cost recreation activities. Low-income populations are currently underrepresented in the park compared to the state as a whole, and compared to the five counties surrounding the park. However, no information is available to precisely identify the visitation patterns of low-income visitors, such as where they stay and what activities they enjoy in the park. Therefore, the potential impact of a change in lodging or recreation opportunities on low-income populations cannot be quantified.

In the absence of precise data, this analysis assumes that low-income visitors favor lower-cost accommodations, such as camping or lodging at Housekeeping Camp, and inexpensive activities

such as swimming, wading, or hiking. Alternative 2 would not likely affect the availability of day-visitor activities. Therefore, the potential impact of Alternative 2 on low-income visitors is related primarily to the change in availability of comparatively low-cost lodging accommodations. A decrease in the total number of campsites and a small number of Housekeeping Camp units under Alternative 2 would likely result in a long-term, minor, adverse impact on low-income visitors. Conversely, an increase in the total number of campsites under Alternative 2 would likely result in a long-term, minor, beneficial impact on low-income visitors.

Summary of Alternative 2 Impacts. Under Alternative 2, the number of overnight accommodations in the park could be maintained, reduced, or increased from that under Alternative 1. Should the total number of in-park accommodations remain the same, the composition of the Yosemite visitor population would not differ from that under Alternative 1. Should the total number of in-park accommodations decrease, there would be a local, long-term, minor, adverse impact on park overnight visitors. Conversely, should the total number of in-park accommodations increase, there would be a local, long-term, minor, beneficial impact on park overnight visitors.

Alternative 2 would likely result in a long-term, minor, adverse impact on low-income visitors due to the potential decrease in campsites and Housekeeping Camp units. Conversely, an increase in the total number of campsites under Alternative 2 would likely result in a long-term, minor, beneficial impact on low-income visitors.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the visitor populations.

Past Actions. Upper and Lower River Campgrounds were damaged by the 1997 flood and have been closed to visitors. In addition, a substantial number of units at the Yosemite Lodge were damaged during the flood and have been removed. Closure of these campgrounds and lodging units reduced the number of in-park accommodations available, further exacerbating unmet demand for accommodations. Closure of these facilities has had a local, long-term, adverse effect on park overnights, due to the clearly detectable reduction in park accommodations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have a net adverse effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the visitor population include:

- Yosemite Area Regional Transportation System (YARTS)
- Wawona Campground Improvement (NPS)

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley if the Restricted Access Plan were implemented. It is anticipated that the regional, long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

The Wawona Campground Improvement project would improve the existing camping facilities at Wawona Campground and would construct additional campground facilities in Section 35 in Wawona. This project would have a local, long-term, beneficial impact on the visitor population by increasing the number of campsites in the park.

A reasonably foreseeable future project that could have a net adverse effect on the visitor population includes:

- *The Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would substantially reduce the number of lodging facilities and nominally reduce the number of campsites in Yosemite Valley, resulting in a local, long-term, adverse impact on the visitor population due to decreased opportunities to lodge and camp in the Valley. Since the number of less expensive lodging and camping units would be reduced under the *Yosemite Valley Plan*, the number of low income visitors able to stay overnight in the Valley may be reduced. This could represent a local, long-term, adverse impact on the low-income visitor population.

The cumulative projects would have a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Given the reduction in the number of lodging and camping units, these cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to decreased opportunities to lodge and camp in the Valley.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 2 and the cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to the potential overall reduction in the number of lodging and camping units in the park. The potential for overnight accommodation facilities to be maintained, reduced, or increased in the Valley, as described in Alternative 2 of the *Merced River Plan/FEIS*, would be clarified by the actions proposed in the *Yosemite Valley Plan*.

Conclusions. Under Alternative 2, the number of overnight accommodations in the park could be maintained, reduced, or increased from that under Alternative 1. Should the total number of in-park accommodations remain the same, the composition of the Yosemite visitor population would not differ from that under Alternative 1. Should the total number of in-park accommodations decrease, there would be a local, long-term, minor, adverse impact on park overnight visitors. Conversely, should the total number of in-park accommodations increase, there would be a local, long-term, minor, beneficial impact on overnight park visitors.

Alternative 2 would likely result in a long-term, minor, adverse impact on low-income visitors due to the potential decrease in campsites and Housekeeping Camp units. Conversely, an increase in the total number of campsites under Alternative 2 would likely result in a long-term, minor, beneficial impact on low-income visitors.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 2 and the cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to the potential overall reduction in the number of lodging and camping units in the park. The potential for overnight accommodation facilities to be maintained, reduced, or increased in the Valley, as described in Alternative 2 of the *Merced River Plan/FEIS*, would be clarified by the actions proposed in the *Yosemite Valley Plan*.

Regional Economy

Analysis

General Impacts. As stated in the discussion of the Visitor Populations, the number of overnight accommodations in the park could be maintained, reduced, or increased from that under Alternative 1. Should the total number of in-park accommodations remain the same under Alternative 2, Yosemite visitor spending in the region would not be expected to differ from that under Alternative 1.

Should the total number of in-park accommodations decrease, the Yosemite visitor population and visitor spending would be expected to change: in the short term, visitor spending would decrease somewhat, because former park overnights would become day visitors. In the long run, however, visitor spending would increase somewhat, because former park overnights would become local overnights, who generally spend more per capita than park overnights. In the short term, the decrease in visitor spending in the affected region would have a negligible, adverse impact on the regional economy. In the long term, the increase in visitor spending would have a negligible, beneficial effect on the regional economy. The shift in the number of park overnights as compared to day users that could result under Alternative 2 would not likely have a discernible effect on the regional socioeconomic environment, given the small magnitude of the potential shift in visitor spending as compared to the size of the regional tourist economy. In the long term, increased visitor spending in the affected region would negligibly increase output, income, and employment in the gateway region.

Should the total number of in-park accommodations increase, visitor spending in the affected region would be expected to decrease somewhat, because former local overnights could select to stay in the park rather than the gateway communities, and park overnights generally spend less per capita than local overnights. The decrease in visitor spending would have a long-term, negligible, adverse effect on the regional economy. The shift in local overnights to park overnights that could result under Alternative 2 would not likely have a discernible effect on the regional socioeconomic environment, given the small magnitude of the shift in visitor

spending as compared to the size of the regional tourist economy. The decrease in visitor spending in the affected region would negligibly decrease output, income, and employment in the gateway region.

Alternative 2 could result in shifts in regional employment. Application of the management zone prescriptions could result in the closure of certain facilities (such as the Valley stable), and the development of other facilities (such as a transit center at Taft Toe or Camp 6), resulting in changes in employment within the park. In addition, potential changes in the composition of park overnighers and local overnighers could shift employment associated with overnight accommodations from within the park to the gateway region, or vice versa. These shifts in employment would constitute a long-term, negligible, beneficial impact on the regional economy. The impact would be beneficial, since it is unlikely that Alternative 2 would decrease regional employment compared to the No Action Alternative.

Implementation of Alternative 2 could result in construction activity associated with removal or development of facilities in the river corridor. Although the magnitude of the construction activity is not quantifiable, the activity would generate construction-related output, employment, and income in the regional economy. This would have a short-term, negligible, beneficial impact on the regional economy, due to the temporary nature of construction activity and the expected small magnitude of the construction activity compared with the size of the construction industry in the affected region.

Summary of Alternative 2 Impacts. Under Alternative 2, the number of overnight accommodations in the park could be maintained, reduced, or increased from that under Alternative 1. Should the total number of in-park accommodations remain the same, visitor spending in the region would not be expected to differ from that under Alternative 1. Should the total number of in-park accommodations decrease, Yosemite visitor spending would increase in the affected region, resulting in a long-term, negligible, beneficial effect on the regional economy. The impact would be negligible due to the small magnitude of the shift in visitor spending as compared to the size of the regional tourist economy. Conversely, should the total number of in-park accommodations increase, Yosemite visitor spending would decrease in the affected region, resulting in a long-term, negligible, adverse effect on the regional economy.

Alternative 2 could result in shifts in regional employment, which would have a long-term, negligible, beneficial impact on the regional economy.

Implementation of Alternative 2 could result in construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the regional economy.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the regional economy are listed below.

- The *Yosemite Valley Plan* (NPS)
- Yosemite Area Regional Transportation System (YARTS)
- Development-related projects, such as Yosemite West Rezoning Application (NPS), Hazel Green Ranch (Mariposa Co.), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort, June Lake (Mono Co.), Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge Expansion (Tuolumne Co.), Hardin Flat Lodging and Conference Facilities (Tuolumne Co.), Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.), Silvertip Resort Village Project (Mariposa Co.)

The *Yosemite Valley Plan* would have a short-term, beneficial impact on the regional economy resulting from project construction spending and employment associated with implementation of the alternative. In the long-term, although the *Yosemite Valley Plan* would result in a decrease in in-park accommodations (and its associated visitor spending), the overall economic impacts of changes from visitor spending and operations spending to the regional economy would be long-term and beneficial. It is anticipated that Yosemite visitor spending associated adverse impacts to the regional economy would be more than offset by increased regional output and employment from expanded National Park Service in-park operations and the proposed new park visitor transit system.

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley if the Restricted Access Plan were implemented. It is anticipated that the long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

Several new lodging facilities are planned in the affected region, including tent cabins and hard-sided cabins at Hazel Green Ranch outside the park near the Big Oak Flat Entrance Station (Mariposa Co.), a hotel complex as part of the Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort in June Lake, Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge expansion near Camp Mather, a hotel in Hardin Flat, a motel and restaurant in Second Garrotte Basin (Tuolumne Co.), and the Silver Tip Resort Village Project in Fish Camp. Development of these facilities would expand the overnight lodging capacity of the gateway region. By providing local construction spending and employment during development, increasing lodging revenues and transient occupancy taxes, and providing sources of income and employment for area residents, these facilities would have a long-term, beneficial effect on the regional economy. The development of these facilities would increase demand for government services, including police, fire, and other services; it would be expected, however, that local government taxes assessed for these facilities would offset the incremental costs associated with providing such services.

These cumulative projects would have a short-term, minor, beneficial effect on the regional economy due to project construction spending and employment associated with implementation of the projects. The cumulative projects would have a long-term, minor, beneficial effect on the regional economy due to increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increased lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the cumulative projects. Alternative 2 and the cumulative projects would result in a long-term, minor, beneficial impact on the regional economy due to increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Conclusions. Under Alternative 2, the number of overnight accommodations in the park could be maintained, reduced, or increased from that under Alternative 1. Should the total number of in-park accommodations remain the same, visitor spending in the region would not be expected to differ from that under Alternative 1. Should the total number of in-park accommodations decrease, Yosemite visitor spending would increase in the affected region, resulting in a long-term, negligible, beneficial effect on the regional economy. The impact would be negligible due to the small magnitude of the shift in visitor spending as compared to the size of the regional tourist economy. Conversely, should the total number of in-park accommodations increase, Yosemite visitor spending would decrease in the affected region, resulting in a long-term, negligible, adverse effect on the regional economy.

Alternative 2 could result in shifts in regional employment, which would have a long-term, negligible, beneficial impact on the regional economy.

Implementation of Alternative 2 could result in construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the cumulative projects. Alternative 2 and the cumulative projects would result in a long-term, minor, beneficial impact on the regional economy due to increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Concessioner

Impacts

General Impacts. Under the application of management zones for Alternative 2, several facilities operated by the primary park concessioner would be inconsistent with the management zone prescriptions or the River Protection Overlay and could be relocated from the corridor or removed from the park altogether. The concession facilities that would be inconsistent under this alternative include the Valley stables (located in a 3A zone) and a small number of Housekeeping Camp units (located within the River Protection Overlay). Conservatively assuming that Alternative 2 could result in the removal of the Valley stable and the potential discontinuation of

visitor lodging at a small number of the Housekeeping Camp units, this would have an adverse impact on concession revenues.

Under the current concession contract, a greater than 2% change in concession revenues would constitute a major impact for the primary park concessioner because of the high fixed costs experienced by the concessioner. This threshold provides a reasonable opportunity for net profit for the primary park concessioner in relation to capital invested and the obligations of the contract, as required by the National Park Service Concessions Management Improvement Act of 1998. Conservatively assuming the removal of all primary park concessioner facilities that would be inconsistent with the management zones, this alternative would decrease annual revenues (based on 1998 data) by about 1%, a local, short-term, moderate, adverse impact on park concession operations. The impact would be short-term because it would extend through the period of the current concession contract, which expires in 2008, after which a new contract would be negotiated. In the long-term, the impacts to the park concessioner would be unknown because the terms of the future contract are unknown.

Summary of Alternative 2 Impacts. The Valley stable and a portion of the Housekeeping Camp would be inconsistent with the management zoning prescriptions under this alternative and could be relocated from the corridor or removed from the park altogether. Removal of such facilities from the park would constitute a short-term, moderate, adverse impact on concessioner revenues.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to concessioner operations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have an adverse effect on the concessioner are listed below.

- The *Yosemite Valley Plan* (NPS)
- The update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness

The *Yosemite Valley Plan* proposes changes to park facilities that are expected to have a local, long-term, adverse impact on the primary concessioner. The adverse impact is associated with locating new employee housing outside of the Valley, and a decrease in annual concessioner profits (although the profit loss could be offset and result in the concessioner's net profit being unaffected).

The update to the *Yosemite Wilderness Management Plan* (NPS) could restrict visitor use of the Merced Lake High Sierra Camp, resulting in closure of the camp to overnight lodging and a loss of revenues to the concessioner associated with providing overnight lodging services. The cumulative effect of the potential closure of Merced Lake High Sierra Camp would be a local, long-term, adverse impact on primary park concessioner revenues.

The cumulative projects would have a local, long-term, minor, adverse impact on the primary park concessioner associated with locating new employee housing outside of the Valley, a

decrease annual concessioner profits (although this could be offset and result in the concessioner's net profit being unaffected), and possible closure of Merced Lake High Sierra Camp.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on the concessioner associated with locating new employee housing outside of the Valley, a decrease annual concessioner profits (although this could be offset and result in the concessioner's net profit being unaffected), and possible closure of Merced Lake High Sierra Camp. The short-term, moderate, adverse impacts associated with the possible removal of facilities in Alternative 2 of the Merced River Plan would be partially offset by the actions proposed in the *Yosemite Valley Plan*.

Conclusions. The Valley stable and a portion of Housekeeping Camp would be inconsistent with the management zoning prescriptions under this alternative and could be relocated from the corridor or removed from the park altogether. Removal of such facilities from the park would constitute a short-term, moderate, adverse impact on the primary park concessioner revenues.

Alternative 2 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on the primary park concessioner associated with locating new employee housing outside of the Valley, a decrease in annual concessioner profits (although this could be offset and result in the concessioner's net profit being unaffected), and possible closure of Merced Lake High Sierra Camp. The short-term, moderate, adverse impacts associated with the possible removal of facilities in Alternative 2 of the *Merced River Plan/FEIS* would be partially offset by the actions proposed in the *Yosemite Valley Plan*.

Park Operations and Facilities

Analysis

The following discussion provides an overview of the types of impacts to park operations and facilities that could occur within each segment of the Merced River corridor from implementation of Alternative 2.

Impacts in Wilderness. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, and 1C, except at existing facilities, where the zoning would be 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning is not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative. Consequently, the application of zoning within wilderness segments would have no effect on park operations or facilities. Development (short-term impacts) and implementation (long-term impacts) of the VERP framework for wilderness segments of the main stem and South Fork of the Merced River would require additional staff commitments, resulting in minor to moderate, adverse impacts on park operations (primarily resources management, interpretation, and protection staff).

Impacts in Yosemite Valley. The proposed zoning of Yosemite Valley in combination with the VERP framework could alter facilities, management of visitors, and restoration activities within the Merced River corridor and could increase demand on park staff and facilities. The proposed base zone (2C) for east Yosemite Valley would be primarily intermixed with Developed Zones (3A, 3B, and 3C) and Diverse Visitor Experience Zones (2A, 2B, and 2D). Additional facilities could include roads (new or relocated), improved trails, shuttle bus stops, restrooms, picnic tables, non-motorized watercraft launch and removal facilities, and other facilities to support individual and group recreation uses and access to the river. Construction of new facilities or removal of existing facilities (e.g., potential removal of the stables consistent with the proposed zoning) would increase demands on staff in the short term during planning, construction/demolition, and restoration. Over the long term, new or rehabilitated facilities could increase or decrease the demand on park operations. For example, construction of additional campgrounds or lodging facilities would likely increase maintenance requirements (adverse impact). Conversely, repair or rehabilitation of failing facilities (e.g., roads, utilities, buildings) could decrease maintenance requirements over the long term compared to the No Action Alternative (beneficial impact).

Application of proposed management zoning under this alternative could decrease, increase, or have no net effect on overnight accommodations in Yosemite Valley (campsites or structured lodging) compared to the No Action Alternative. Although an increase or decrease in these facilities would shift the mix of park overnight visitors and day visitors (i.e., more or fewer visitors would be able to stay overnight in the park, respectively), the total number of visitors to Yosemite Valley would remain unchanged. For example, the River Protection Overlay could result in the removal of some overnight accommodation facilities (e.g., a portion of Housekeeping Camp). Removed facilities could be relocated to appropriate 3A zones within the corridor (e.g., areas adjacent to Upper Pines Campground and Camp 4 that do not currently have camping uses would be zoned 3A and could be converted to camping), to unspecified locations elsewhere in the park, or not at all. If overnight accommodation facilities were removed from the River Protection Overlay and not relocated elsewhere in the park, then the number of park overnights likely would decrease and the number of day visitors, or more precisely, “local overnights,” would increase proportionally. Because there would be no reduction in the total number of visitors, demands on park staff would not decrease (compared to the No Action Alternative), but are expected to be redirected to other divisions. For example, reduction in the total number of overnight accommodations could reduce demand for maintenance and protection services at Valley campgrounds and lodging facilities, but could increase demand for interpretation, resource restoration, and road maintenance (e.g., visitors would need to make two trips per day between their out-of-park accommodations and park attractions, which could have a long-term, negligible to minor, adverse impact on park operations related to road maintenance). Conversely, if the total number of campsites and lodging facilities within Yosemite Valley were increased, additional visitors could be accommodated within the Merced River corridor. The increase in the total number of visitors and duration of visitor impact within the corridor would increase demand for maintenance as well as for visitor protection, resource protection, and restoration services. If those facilities were relocated from within the River Protection Overlay to locations elsewhere in the park, then the current mix of park overnights and day visitors would be maintained, and there would be no net change in park operations compared to the No Action Alternative.

Parking spaces inconsistent with the 2B zone could be removed from the Merced River corridor. If those spaces were removed and not relocated elsewhere (and assuming no decrease in visitation), then demand for road maintenance, protection, and resources (restoration) staff could increase, as visitors unable to find an authorized place to park could circle the Valley (increasing road wear) or could decide to park in unauthorized/improper areas (increasing the need for protection and restoration). This would have a long-term, minor, adverse impact on park operations in Yosemite Valley. If parking spaces were relocated to other areas in the river corridor with a 3C zone designation (e.g., a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6 in Yosemite Valley), the relocated spaces would reduce the above-described adverse effects of removing parking spaces within the river corridor. However, additional demand for facilitates maintenance would be created, resulting in a negligible to minor, adverse effect on park operations.

Potential future development of a transit center and/or day-visitor parking facility in Yosemite Valley would allow the National Park Service to more effectively manage access to the Merced River corridor. Day visitors (i.e., visitors without reservations for overnight accommodations in Yosemite Valley) would be intercepted at a traffic check station on Southside Drive near the El Capitan crossover and would be directed to the transit center and/or day-visitor parking facility (at either Taft Toe or Camp 6). Day visitors then would move between destinations in the Valley by shuttle bus, bicycle, or on foot. Shifting visitors (local overnighers and day visitors) from their private vehicles to Valley shuttle buses would redirect demand from currently affected park operations (e.g., protection) to other divisions (e.g., restoration, maintenance, and custodial services). While the number of private vehicles would be reduced, the number of shuttle buses would increase. The increased weight of shuttle buses would likely increase wear on Valley roads and require increased maintenance (a long-term, moderate, adverse impact). In addition, the zoning of lands adjacent to the potential transit center and/or day-visitor parking facility (zone 2B) would call for minimizing the adverse impacts of human presence in those parts of the river corridor. The challenge of managing the highly concentrated flow of visitors into and out of the transit center and/or day-visitor parking facility, while affording maximum protection to adjacent lands, would also be likely to increase demand on park operations services and facilities, such as restoration, protection, maintenance, and custodial services. Because of these countering factors, it is unclear whether construction of a transit center and/or day-visitor parking facility would have an overall adverse or beneficial impact on park operations and facilities.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have short- and long-term, major, adverse impacts on park operations and facilities because visitor use is relatively high (is expected to remain consistent or increase), access throughout the Valley is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. For example, if El Capitan Meadow (zone 2B) were managed to the desired condition (e.g., moderate to high-quality meadow habitat with low to moderate visitor encounters), demand on park operations (primarily protection and resources staff) would dramatically increase related to meadow restoration, patrolling (to discourage informal use of the meadow and informal parking), and direction of visitors to more appropriate zones (e.g., the proposed 2C picnic area at the base of El Capitan). This effect would be most pronounced during initial application of VERP management actions, while park visitors became

accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a major, long-term, adverse impact on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Impacts in the Merced River Gorge and El Portal. The gorge would be zoned (2A+, 2B, 2C, and 2D) consistent with existing conditions. Management of the 2D zone below the Cascades to its desired condition is expected to increase maintenance, protection, and interpretation services within the zone (e.g., related to litter, restrooms, parking, education) and to implement the zone boundary (e.g., between the 2D Attraction Zone and the 2B Discovery Zone), resulting in a minor, long-term, adverse effect on park operations and facilities. The remainder of the gorge is relatively inaccessible, and visitor use is unlikely to increase. Consequently, there would be no impact on park operations and facilities for the remainder of the gorge compared to the No Action Alternative.

Potential future actions (e.g., removal of Cascades Diversion Dam), or new or rehabilitated facilities (e.g., restrooms, roads) could occur consistent with the proposed management zoning and River Protection Overlay. If implemented, these future actions could create short-term, moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction/demolition. Because these potential actions would be implemented to protect resources (e.g., road repair could reduce erosion and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor to moderate and beneficial.

Application of the proposed Day Use (zone 2C) and Park Operations and Administration (zone 3C) zones in El Portal could decrease, increase, or have no net effect on development within El Portal compared to the No Action Alternative. An example of decreased operations is the application of the 2C zoning at the Sand Pit (currently used for construction staging and other administrative purposes). The current use of the Sand Pit would be inconsistent with the proposed 2C zoning and could be removed. Removal of facilities such as the Sand Pit would increase staff requirements in the short term (related to removal), but could decrease staff requirements over the long term (related to facility maintenance). Because the management zoning does not specify specific actions, there would be no effect on development within El Portal and no impact on park operations and facilities compared to Alternative 1. Alternatively, if the 3C zones were fully built out, the demand on park operations and facilities would dramatically increase for El Portal compared to the No Action Alternative. In the short term, resource, planning, and facility staff would be required to accommodate construction of new facilities (short-term, moderate to major, adverse impact). Over the long term, demand on protection and maintenance staff would increase proportional to development, resulting in a long-term, moderate to major, adverse impact on park operations and facilities.

Development of the VERP framework and its implementation within the gorge and El Portal is considered to have only minor to moderate, adverse impacts on park operations and facilities because visitor use is relatively low and is expected to remain relatively low due to access and topography constraints.

Impacts in Wawona. The majority of Wawona would be zoned consistent with existing conditions and would have no net effect on park operations or facilities compared to Alternative 1. Portions of existing facilities immediately adjacent to the South Fork, such as portions of Wawona Campground and the Wawona maintenance yard, would be inconsistent with the River Protection Overlay and could be removed. Demand for park operations, facilities, and resource staff would likely increase in the short term during removal (short-term, minor, adverse impact). However, the long-term effect of removal or relocation is considered only negligible to minor and adverse, because these facilities could be relocated elsewhere within the corridor or outside the corridor.

Potential future actions (e.g., removal or replacement of Wawona Bridge, construction of new restrooms) could occur consistent with the proposed management zoning and River Protection Overlay. If implemented, these future actions could create short-term, moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction/demolition. Because these potential actions would be implemented to protect resources (e.g., bridge replacement to restore the free flow of the river and decrease erosion, scour, and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor and beneficial.

Development of the VERP framework and its implementation within Wawona is considered to have only minor to moderate, adverse impacts (both short-term and long-term) on park operations and facilities, because visitor use is relatively low (and change in visitor use patterns for Wawona under this alternative is considered speculative) and because the proposed management zoning is designed to facilitate implementation of the VERP framework over the long term (e.g., wilderness portions of the corridor immediately adjacent to developed zones are generally zoned 1B to account for the potential conflict with adjacent visitor and land uses).

Summary Alternative 2 Impacts. In total, application of management zoning and the River Protection Overlay, in combination with development and implementation of the VERP framework, would substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by an increased need for research, planning, and monitoring to establish scientifically based indicators, standards, and monitoring protocols for the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones and the River Protection Overlay to their desired conditions would further increase demand on park staff and resources. Overall, implementation of VERP, in combination with other management elements proposed under Alternative 2, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Impacts would be most pronounced in Yosemite Valley and El Portal, where visitor use is more concentrated, but would affect the entire corridor to some degree.

Cumulative Impacts

Cumulative effects on park operations and facilities discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the immediate Yosemite region in combination with potential effects of this alternative. The extent to which past, present, or

reasonably foreseeable projects could have a cumulative effect, when combined with other actions that could result under present National Park Service management strategies, is determined largely by whether such projects would affect demand for park operations services and facilities. For example, effects of projects that change the number of vehicles traveling through the park could combine with effects of the *Merced River Plan* to either increase or decrease the need for maintenance activities on roads and bridges. Similarly, projects that affect demand for other park operations services and facilities could also have a cumulative effect. These services include maintenance of utility systems, provision of interpretation programs, visitor protection, and resource management.

Past Actions. Park operations and facilities have been affected by numerous past National Park Service management decisions made since the inception of the park. Primary among those, when considered in relation to the potential effects of the *Merced River Plan*, include relocating the National Park Service maintenance shops and warehouse to El Portal (mostly adverse), removal of the hydroelectric generating plant (mostly adverse), professionalization of law enforcement staff (mostly adverse), rehabilitation of the water and electric distribution systems (mostly beneficial), improved communication systems (cell phones and radios, mostly beneficial), relocating the National Park Service wastewater treatment facility from Yosemite Valley to El Portal (mostly beneficial), and implementation of the prescribed fire program (adverse and beneficial). Overall, there is no net adverse or beneficial effect of these past actions on park operations and facilities.

Present Actions. Present actions that affect park operations and facilities include planning related to the *Yosemite Valley Plan* (NPS) and the El Portal Road Reconstruction Project (NPS). The *Yosemite Valley Plan* has substantially increased demand on resource, facility, and planning staff. The El Portal Road Reconstruction Project (NPS) is currently underway and affects park operations and facilities because the reconstruction is placing some increased demand on park operations staff.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Projects that could have a cumulative, beneficial effect on park operations and facilities include those that could reduce the number of visitors entering the park, reduce the number or amount of facilities within the park, or reduce long-term maintenance activities. Examples of these types of projects include:

- Transportation projects including the Yosemite Valley Shuttle Bus Stop Improvements (NPS), South Fork Merced River Bridges Replacement (NPS), and Evergreen Road Improvements (multi-agency, see Appendix G)
- Several Yosemite utility projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line, Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, and Hodgdon Meadows Water and Wastewater Treatment Improvements (NPS), and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

- Planning efforts, including the South Entrance/Mariposa Grove Site Planning (NPS), update to the *Yosemite Fire Management Plan* (NPS), update to the *Yosemite Wilderness Management Plan* (NPS), and *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

Although each of the aforementioned projects could have short-term, adverse effects associated with planning, construction, replacement, or rehabilitation, the general goal of each of these projects is to reduce long-term maintenance. Therefore, these projects could have a long-term, beneficial, cumulative impact on park operations and facilities.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on park operations and facilities include:

- The Yosemite Area Regional Transportation System (YARTS), which has a goal of increasing transportation options and reducing reliance on automobiles in the area
- Planned rehabilitation of Tamarack Campground, Yosemite Creek Campground, Hodgdon Meadow Campground, Wawona Campground Improvement, and Bridalveil Horse Camp (NPS)
- Development-related projects such as Yosemite West Rezoning Application (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI), Tuolumne Meadows Development Concept Plan (NPS), Resource Management Building (NPS), Expansion of Mariposa County Transit System; and University of California, Merced Campus (Merced Co.)

Cumulative effects of the campground rehabilitation projects could be mixed, combining both adverse and beneficial effects. For example, the rehabilitation of Tamarack Campground would have a short-term, adverse effect on park operations and facilities during planning and construction. Post-construction, maintenance would be reduced compared to existing conditions, resulting in a long-term, beneficial impact on park operations and facilities.

Reasonably foreseeable projects that could have an adverse effect on park operations and facilities include:

- The *Yosemite Valley Plan* (NPS), which would implement the goals of the 1980 *General Management Plan*
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several regional lodging projects, including Yosemite Motels, Silvertip Resort Village Project (Mariposa Co.); Tioga Inn, Lee Vining (Mono Co.), Hazel Green Ranch (Mariposa Co.); and Evergreen Lodge Expansion (multi-agency, see Appendix G)
- Merced River Canyon Trail Acquisition (BLM)
- Sierra Nevada Framework for Conservation and Collaboration (USFS)

Each of these projects would increase demand for services and facilities and add to the cumulative, adverse impact on park operations and facilities. For example, the *Yosemite Valley Plan* could substantially increase demand on park operations and facilities in the short term during planning, repair, rehabilitation, construction/demolition and replacement of facilities (e.g.,

removal of the road through Stoneman Meadow, construction of new campsites, restoration of large areas of Yosemite Valley to natural conditions).

These past, present, and reasonably foreseeable future actions could have adverse, cumulative effects on park operations and facilities because of the increased demand on park operations services and facilities over both the short and long term. The combined effects of Alternative 2 with other cumulative projects would result in a long-term, major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Conclusions

Application of management zoning and the River Protection Overlay, in combination with development and implementation of the VERP framework, could substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by an increased need for research, planning, and monitoring to establish scientifically based indicators, standards, and monitoring protocols related to the development of the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones and the River Protection Overlay to their desired conditions would further increase demand on park staff and resources. Overall, implementation of VERP, in combination with other management elements proposed under Alternative 2, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Impacts would be most pronounced in Yosemite Valley and El Portal, where visitor use is more concentrated, but would affect the entire corridor to some degree.

The combined effects of Alternative 2 with other cumulative projects would result in a long-term, major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Unavoidable Adverse Impacts

Under Alternative 2, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework.

The application of the River Protection Overlay could allow for the removal of human-made obstructions to the free-flowing condition of the river. If one or more of the historic bridges considered to be an obstruction to the free flow condition of the river were removed, then this would constitute an unavoidable adverse effect.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have an unavoidable adverse effect on park operations and facilities, because visitor

use is relatively high (is expected to remain consistent or increase), access throughout the Valley is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. This effect would be most pronounced during initial application of VERP management actions, while park visitors became accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a unavoidable adverse effect on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Irreversible and Irretrievable Commitments of Resources

This section identifies any resources that would be lost either temporarily or permanently as a result of Alternative 2. This alternative provides a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework.

The application of the River Protection Overlay could allow for the enhancement of natural resources in the river corridor. Therefore, no natural resources would be irreversibly or irretrievably committed as a result of Alternative 2.

The application of the River Protection Overlay provides for the possibility of removing human-made obstructions, which include historic bridges, within the river corridor. If any historic bridges were removed, then the loss of this cultural landscape resource would be permanent and irreversible.

If relocation of existing facilities and/or the development of new facilities within the river corridor occurred as a result of the management zoning designations under Alternative 2, then this would result in the expenditure of energy to relocate or develop the facility. In addition, if the relocation of existing facilities and/or the construction of new facilities occurred, then there would be an irreversible commitment of materials, such as concrete, asphalt, wood, and metal, that would be used in relocation or construction activities.

Relationship of Short-Term Uses of Man's Environment and Long-Term Productivity

This section compares the short- and long-term environmental effects of Alternative 2.

Under Alternative 2, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework. The application of the River Protection

Overlay could have short-term adverse impacts and long-term beneficial impacts. Short-term impacts could occur if obstructions in the river were removed and streambanks along the river were restored. These actions could temporarily adversely affect biological resources along the river, including vegetation and wildlife, as well as water quality. In the long term, if streambank restoration and obstruction removal occurred, then this would enhance the free-flowing condition of the river and natural resource Outstandingly Remarkable Values (e.g., biological, hydrologic processes, etc.). The intensity of the impact would depend on the level of streambank restoration and the number of obstructions removed. Also in the long term, benefits could occur to floodplains if the river were restored to natural geomorphic conditions, to water quality if human interaction with the river were limited, and to biological resources if wetland habitat for plant and animal species were restored.

The 3C management zone under Alternative 2 could allow for the development of a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6. If the transit center and/or day-visitor parking facility were constructed, then localized air quality, noise, cultural resource, and natural resource impacts could occur. In addition, if the transit center and/or day-visitor parking facility were constructed, then a long-term benefit to the park could occur through the reduction of traffic congestion, the improvement of local air quality in the Valley, and the provision of a more structured visitor experience in accessing the river corridor.

Alternative 3: River Protection Emphasis, Narrow Corridor

Alternative 3 emphasizes resource protection of the Merced River corridor in the floodplain areas. The management philosophy focuses on reducing impacts on natural resources, removing facilities from the floodplain, and actively restoring the river corridor to address historical human manipulations of the river.

For the duration of the *Merced River Plan*, Alternative 3 would provide a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework. Compared to Alternative 1, which has no such management framework, this is considered to be a minor, beneficial impact for visitor experience, natural resources, cultural resources, social resources, and associated Outstandingly Remarkable Values.

Boundaries. The boundary in this alternative is generally defined by the 100-year floodplain in Yosemite Valley, El Portal, and Wawona (including meadows and wetlands), and by a quarter-mile boundary for the rest of the river (see figures II-15 through II-18 in Chapter II, Alternatives). No changes to the boundaries are proposed under Alternative 3 compared to Alternative 1. Consequently, there are no impacts on visitor experience, natural, cultural, and social resources, and Outstandingly Remarkable Values. Boundaries are not discussed further in this alternative.

Classifications. No changes to the classifications (shown in figure II-3) are proposed under Alternative 3 compared to Alternative 1. Consequently, there are no impacts on visitor experience, natural, cultural, and social resources, and Outstandingly Remarkable Values. Classifications are not discussed further in this alternative.

Outstandingly Remarkable Values. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised in this alternative based on the application of new scientific information, changed conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act (refer to Appendix E for a history of the Outstandingly Remarkable Values). Specifically, those resources that are not directly related to the Merced River (e.g., western juniper, air quality, skiing, rock climbing) or are not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., 1916 Organic Act, Federal Endangered Species Act, Clean Water Act). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft*

Yosemite Valley Housing Plan. The change in Outstandingly Remarkable Values is discussed as appropriate under specific resource topics addressed for this alternative.

Section 7 Determination Process. The application of the consistent Section 7 determination process for water resources projects would provide a negligible, beneficial impact on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values compared to Alternative 1 because management direction for future water resources would be provided. Application of the consistent Section 7 determination process is discussed as appropriate under specific resource topics addressed for this alternative.

Management Zoning. Management zoning could have long-term, beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values within the Merced River corridor. Alternative 3 designates considerable area with zoning that restricts new uses and facilities in the river corridor. This management element would limit the type of new facilities that could be built, would encourage the removal of inconsistent facilities, and would allow new development or redevelopment as appropriate. Management zoning is discussed as appropriate under specific resource topics addressed for this alternative.

River Protection Overlay. The River Protection Overlay could have long-term, beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values within the Merced River corridor. This management element would limit the type of new facilities that could be built, would minimize adverse effects of new facilities (e.g., bridges, roads) to Outstandingly Remarkable Values and the free-flowing condition of the Merced River, and would encourage the removal of inconsistent facilities. The River Protection Overlay is discussed as appropriate under specific resource topics addressed for this alternative.

Visitor Experience and Resource Protection. Implementation of the VERP framework would have beneficial and adverse impacts on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values. The VERP framework protects both park resources and visitor experience, with particular focus on the Outstandingly Remarkable Values, from impacts associated with visitor use, and helps managers address issues associated with visitor use. The VERP framework is discussed as appropriate under specific resource topics addressed for this alternative.

Natural Resources

Geology, Geohazards, and Soils

Analysis

General Impacts. Geologic resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., cirques, paternoster lakes) or not unique to the region or nation have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*), as well as by federal law (the Organic Act, Wilderness Act). Geologic-process Outstandingly Remarkable Values include the mature, meandering nature of the Merced River through Yosemite Valley, a classic V-shaped river through the gorge, evidence of ice-age glaciation (U-shaped and hanging valleys), and extraordinary granite features (i.e., exfoliation domes). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Rockfall Hazards. Under application of management zones for Alternative 3, facilities could be relocated from ecologically vulnerable areas along the Merced River and South Fork to areas susceptible to the risks of rockfalls. Most rockfalls occur from sheer granite cliffs and are associated with natural triggering events such as earthquakes, climatic changes, rainfall events, or gradual stress release and exfoliation of the granite. Relocation of facilities into rockfall-susceptible areas would be expected to occur primarily in Developed zones (3A-3C) such as Yosemite Valley, the Merced River gorge, and possibly along the South Fork in the Wawona area. For example, Alternative 3 could rezone some Yosemite Valley non-wilderness areas to Open Space (2A) or Discovery (2B), thus requiring certain visitor facilities to be relocated away from the Merced River floodplain and closer to the sheer granite walls of the Valley. Rockfall hazards would continue in the upper wilderness reaches of the Merced and South Fork, zoned as Wilderness (1A-1D), but the potential for impacts to visitors and facilities would be low and would not change from Alternative 1. Under Alternative 3, the National Park Service could retain and revise current management guidelines pertaining to geologic hazards and resources, such as policies implemented to protect visitors and reduce damage to park infrastructure. If relocation of existing facilities out of the floodplain were to occur, the National Park Service could conduct appropriate studies to determine proximity of the facility to the high-risk rockfall zones and the stability of the adjacent rock cliffs.

Considering the unpredictable and unavoidable nature of rockfalls and the potential for them to occur throughout Yosemite National Park, Alternative 3 would result in a long-term, moderate, adverse impact on public safety from hazards associated with rockfall events.

Seismic Hazards. Historically, seismic events in the Sierra Nevada and Yosemite National Park have been relatively infrequent; however, when they do occur, the resultant groundshaking is capable of triggering rockfalls and producing ground accelerations that are higher than some older, less structurally stable buildings can tolerate. Typically, the seismic risks of injury to visitors and damage facilities would occur in the developed portions of Yosemite National Park such as Yosemite Valley, El Portal, and Wawona. In these areas, buildings and other facilities placed within saturated alluvial soil (for instance within the floodplain of the Merced River) could also be susceptible to secondary hazards from seismic groundshaking, including liquefaction and seismically induced settlement. For example, within Yosemite Valley, any potential facility development at Camp 6 (zone 3C) would require construction within alluvial sediments that could be susceptible to effects of unstable soils (such as settlement) and, in the event of significant groundshaking, the effects of liquefaction. In undeveloped areas where visitor use is relatively low (for instance, in the upper wilderness reaches of the Merced River and the South Fork), groundshaking effects from seismic events would result in a lower potential for injury and structural damage.

Under Alternative 3, as in Alternative 1, earthquakes in the Sierra Nevada region would continue to expose visitors in developed areas to potential injury in unstable buildings and to hazards from seismically triggered mass movement of rock slopes. Alternative 3, however, could restrict or remove facilities from the Merced River corridor; thus, the risks of secondary hazards from seismic shaking, including liquefaction and seismically induced settlement, would be reduced compared to the Alternative 1. Therefore, considering the potential for earthquake events in the Sierra Nevada, their unpredictable nature and unavoidable effects, and considering that, under this alternative, adverse secondary effects could be reduced, Alternative 3 would have a negligible, beneficial impact on public safety related to seismic hazards compared to Alternative 1.

Impacts to Soils. Construction excavation and replacement of native soils with engineered fills contribute to the reduction of local native soil. Excessive surface water runoff or loss of protective vegetation cover can cause erosion. Management zoning under Alternative 3 would place greater restrictions on visitor use and facility development within the Merced River corridor. These restrictions could reduce the potential for localized and concentrated use that could result in erosion, soil compaction, and loss of surface soils. For instance, an area adjacent to the Merced River would be zoned as Open Space (2A), resulting in less visitor usage than under Alternative 1.

As a result of efforts to manage visitor use to protect natural and cultural resources within the Merced River corridor, including management zoning, the VERP framework, and the River Protection Overlay, soil erosion impacts due to visitor use and development projects would be less severe than under Alternative 1. The implementation of the VERP framework would have a long-term, moderate, beneficial impact on soil resources. For instance, if soil compaction were selected as an indicator of desired conditions under the VERP framework, violations of the standard associated with this indicator would result in management action to manage or limit visitor use in a particular area. The management action could be to install signs or fences directing visitor use toward resilient areas and away from sensitive resources. Greater restrictions on visitor use and facility development and more restrictive management zoning in combination

with the VERP framework would reduce soil disturbance under Alternative 3. Therefore, Alternative 3 would result in a long-term, minor, beneficial impact on soil resources.

Summary of Alternative 3 Impacts. Compared to the Alternative 1, rockfall hazards under Alternative 3 would result in a long-term, moderate, adverse impact, especially considering that, under Alternative 3, facilities could be relocated to areas susceptible to hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable. When compared to Alternative 1, however, Alternative 3 would reduce the risk of secondary hazards, and thus would have a long-term, minor, beneficial impact on public safety. More restrictive management zoning for development, the VERP framework, and the consequential reduction of soil disturbance under Alternative 3 would result in a long-term, minor, beneficial impact on soil resources compared to Alternative 1.

Considering the collective risks associated with rockfalls, seismic hazards, and impacts to soil resources, the implementation of potential future actions in accordance with the management zones of Alternative 3 would result in a long-term, negligible, adverse impact compared to Alternative 1.

Cumulative Impacts

Cumulative impacts to geological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect geological resources within the river corridor or in the park vicinity.

Various reasonably foreseeable future actions could eventually result in construction of additional structures and facilities within zones susceptible to adverse impacts from earthquakes and rockfalls. These facilities would likely be located in developed areas, including Yosemite Valley, the El Portal Administrative Site, and Wawona.

Past Actions. Development projects intended to serve park visitors in Yosemite National Park have included hotels, visitor centers, campgrounds, and bridges with associated roads and parking lots. In addition, facilities required for park infrastructure support, including employee housing, utility facilities, maintenance yards, and supply storage areas, have been developed throughout the park. As popularity of Yosemite attracted a greater number of visitors, the number and magnitude of these projects increased to meet visitor demand. Past actions have resulted in adverse impacts because projects were developed in areas that could be susceptible to damage from geohazards (rockfalls and seismic events), and facility development has contributed to the overall degradation of soil resources in the park.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within

the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects geology, geohazards, and soils. The reconstruction requires steepening the sheer rock slopes along the north side of the roadway, which increases the potential for rockfalls over the short term (by decreasing stability of the rock slopes). However, under the direction of engineers, design features for rock cuts along the El Portal Road (e.g., rock-bolting using 30-foot-long dowells) serve to increase the long-term stability of the rock slopes. These design features are also used to stabilize colluvial soil cuts, thereby reducing erosion. On the south side of the El Portal Road, shoulder widening requires construction of a fill slope that, in certain areas, encroaches into the Merced River. These effects are partially mitigated by implementation of standard design and construction-related best management practices. The project also involves rehabilitation of the sewerline, which reduces potential soil contamination, and the improvement of roadway drainage, thereby reducing erosion. The encroachment of the fill slope into the Merced River would cause minor obstruction to the free-flowing condition of the river. Overall, the El Portal Road Reconstruction (Segment D) Project would have a beneficial impact by reducing rockfall and soil erosion potential.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on geohazards and soil resources include:

- Several campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS), both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- Transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., potential short-term construction erosion and soil loss), an objective of each of these projects is to restore and manage natural resources and reduce soil degradation. Therefore, these projects could have a net long-term, beneficial, cumulative impact on soil resources.

Reasonably foreseeable projects that could have both adverse and beneficial effects on regional geology, geohazards, and soils include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and White Wolf Water System Improvements (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Wawona Campground Improvement (NPS)
- Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, projects under this plan would not increase rockfall and seismic hazards, and would have a beneficial impact by reducing degradation of soil resources in Yosemite Valley.

Cumulative effects of the above-referenced projects could be a combination of adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term benefit on soil resources by increasing coordinated management of natural resources. However, short-term adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project above Cascades Diversion Dam). The current approach for the Segment D widening would require redesign. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., steepening of sheer rock slopes, potentially leading to short-term, slope instability, and traffic circulation, safety, and noise

impacts). The net effect of these projects is difficult to anticipate, but would likely result in an overall balance between beneficial and adverse effects. Reasonably foreseeable projects that could have an adverse effect on regional geology, increase the potential for impacts related to geologic hazards, and increase soil degradation include:

- Merced River Canyon Trail Acquisition (BLM)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Build Out City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak).

Certain development projects, as listed above, could expose additional visitors to risk of rockfall and seismic hazards and result in increased degradation of soil resources. Examples of projects that would result in a cumulative increase in park development include the construction of South Entrance/Mariposa Grove Site Planning (NPS), the new Resources Management Building (NPS), Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.), and the El Portal Road Reconstruction Project (NPS).

Considering that hazards from geological processes such as rockfalls and earthquakes are unavoidable and unpredictable, park visitors would continue to be exposed to injury and damage from these hazards, thus resulting in a cumulative, long-term, adverse impact. The cumulative effect of future development actions would increase the overall depletion of soil resources by increasing soil removal, compaction, and erosion. Restoration projects may offset the rate of overall soil resource depletion, but not to the extent of providing a cumulative benefit. Future development projects would result in a cumulative, long-term, minor to moderate, adverse impact to soil resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

In combination, rockfall hazards under Alternative 3 and the cumulative projects would result in a long-term, moderate, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, Alternative 3 could relocate facilities away from the floodplain and into areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury. Therefore, Alternative 3 and the cumulative projects would have no impact to public safety associated with seismic hazards, regardless of the long-term, negligible, beneficial impact resulting from the

reduced secondary seismic impacts in Alternative 3. Impacts to soil resources under the cumulative projects could be reduced by Alternative 3 management zoning, VERP, and the River Protection Overlay, and could be offset by the long-term, minor, beneficial impact in Alternative 3, thus resulting in a long-term, minor, adverse impact. Overall, Alternative 3 and the cumulative projects would have a long-term, minor, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor, adverse impact on soil resources.

Conclusions

Compared to Alternative 1, rockfall hazards under Alternative 3 would result in a long-term, moderate, adverse impact, especially considering that, under Alternative 3, facilities could be relocated to areas susceptible to seismic hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable. However, when compared to Alternative 1, Alternative 3 reduces risks of secondary seismic hazards, and thus would have a long-term, minor, beneficial on public safety. More restrictive management zoning for development, the VERP framework, and the consequential reduction of soil disturbance under Alternative 3 would result in a long-term, minor, beneficial impact on soil resources compared to Alternative 1. Considered collectively, the risks associated with rockfalls, seismic hazards, and impacts to soil resources, and the implementation of potential future actions, in accordance with the management zones of Alternative 3, would result in a long-term, negligible, adverse impact compared to Alternative 1.

In combination, rockfall hazards under Alternative 3 and the cumulative projects would result in a long-term, moderate, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, Alternative 3 could relocate facilities away from the floodplain and into areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury. Therefore, Alternative 3 and the cumulative projects would have no impact to public safety associated with seismic hazards, regardless of the long-term, negligible, beneficial impact resulting from the reduced secondary seismic impacts in Alternative 3. Impacts to soil resources under the cumulative projects could be reduced by Alternative 3 management zoning, VERP, and the River Protection Overlay, and could be offset by the long-term, minor, beneficial impact in Alternative 3, thus resulting in a long-term, minor, adverse impact. Overall, Alternative 3 and the cumulative projects would have a long-term, minor, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor, adverse impact on soil resources.

Hydrology, Floodplains, and Water Quality

Analysis

General Impacts. Hydrologic-process Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that do not accurately reflect site conditions (e.g., excellent water quality in Wawona

and below Wawona) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Clean Water Act, 1916 Organic Act). Hydrologic-process Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now generally include excellent water quality, exceptionally steep gradients, extraordinary examples of cascades, and examples of unique hydrologic conditions. The revised Outstandingly Remarkable Values provide greater focus on the Merced River and values unique to the region or nation than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to hydrologic processes that could occur within each segment of the Merced River corridor from application of management elements proposed in Alternative 3.

Impacts in Wilderness. Examples of hydrologic-process Outstandingly Remarkable Values of wilderness segments of the main stem and South Fork of the Merced River include glacial remnants, a logjam in Little Yosemite Valley that is hundreds of years old, and numerous cascades, steep gradients, and excellent water quality. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and River Protection Overlay are not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative, these management elements would limit the type of new facilities that could be built (e.g., large campsites with facilities are prohibited in the 1B zone), which could adversely affect hydrology, floodplains, and water quality under the No Action Alternative. Although actions such as trail rehabilitation could occur under the proposed zoning, these actions would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values within wilderness segments of the Merced River (main stem and South Fork) by reducing visitor effects. For example, if VERP monitoring revealed elevated levels of fecal coliform bacteria in the Merced River due to visitor use (e.g., camping or hiking near the Merced River), VERP management actions (e.g., educational signs, limits on visitor use) could be implemented to achieve the desired condition for water quality in the management zone.

Impacts in Yosemite Valley. Hydrologic-process Outstandingly Remarkable Values within Yosemite Valley include the meandering river, world-renowned waterfalls, an active flood regime, oxbows, unique wetlands, and fluvial processes. Yosemite Valley would be zoned to protect natural resources. Although portions of the east Valley would remain developed, the proposed zoning together with River Protection Overlay in Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the River Protection Overlay) that have the potential to adversely affect hydrology, floodplains, and water quality. In addition, possible future actions (e.g., bridge removal, bridge or road reconstruction, construction of new campsites) that could occur under the proposed zoning would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- The River Protection Overlay could restore the river to more natural geomorphologic conditions through restoration of streambanks and the floodplain. The River Protection Overlay would promote natural processes in the river and floodplain and minimize the alterations of the floodplain due to existing and future facilities. An example of the potential benefit of the River Protection Overlay on the river's hydrologic process would be the potential removal or restriction of facilities near the banks of the river. Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay would allow natural floodplain alterations and lateral movement of the river channel. It also would remove sources of pollutants (e.g., oil), reduce erosion and sedimentation (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation (streambank stabilization). The River Protection Overlay would have the potential to reduce visitor degradation of streambanks and the river channel by limiting the number of locations where human-induced erosion could occur. Additionally, the introduction of refuse and bacteria by visitors could be reduced by the possible realignment or relocation of roads, trails, and visitor facilities. The magnitude of the effect of the River Protection Overlay on hydrologic processes is correlated to the degree to which facilities are removed in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect, whereas removal of several facilities would have a moderate to major, long-term, beneficial effect on the hydrologic processes in Yosemite Valley, an Outstandingly Remarkable Value.
- The potential changes to existing and future structures and visitor use in the 100-year floodplain under Alternative 3 could provide a long-term, minor, beneficial impact in terms of flood protection for park personnel, visitors, and park structures. Flood frequency and hazards are issues in developed areas, such as east Yosemite Valley, where existing structures and visitor-use areas are subject to high water inundation. Alternative 3 would restrict the future placement of nonessential buildings, roadways, and visitor areas and potentially

remove structures in the high-frequency flood areas of the River Protection Overlay. The River Protection Overlay provides a buffer area for natural flood flows and channel formation. Additionally, zones 2A and 2B in the larger floodplain would restrict the placement of park facilities in flood-prone areas. An example of this potential reduced pressure is the zoning of Housekeeping Camp as 2B, where lodging would be inconsistent with the allowable uses, and the removal of facilities could occur. The removal of facilities, restoration of the floodplain, and reduced visitor use of the area would allow a natural floodplain to form where unnatural barriers to flood flows would no longer be present. Overall, flood frequency would be unaffected, but implementation of the criteria for existing and future structures could reduce flood hazards in developed areas and return the flood regime to a more natural state. Alternative 3 could provide a major, long-term benefit to floodplain conditions.

- An example of the potential benefit to water quality would be the concentration of visitors and vehicles in the western portion of Yosemite Valley at Cathedral Beach (zoned 2C) and Sentinel Beach (zoned 2C). The designation of much of the river corridor in this area as Discovery (zone 2A) would focus visitor use to the 2C zones listed above. By limiting the currently dispersed use of the Merced River through this portion of Yosemite Valley to concentrated locations, nonpoint sources of pollution, such as refuse, bacteria, and petroleum and metal products associated with vehicles, would become more manageable.
- A majority of the 100-year floodplain in west Yosemite Valley would be zoned 2A and receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging) that have the potential to adversely affect floodplain characteristics (e.g., water recharge rates, flood dissipation), hydrologic processes of the Merced River (e.g., new facilities could constrict the channel of the Merced River), and water quality (e.g., short-term impacts during construction). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to be managed to their desired condition with continued protection, restoration, and enhancement of hydrologic processes, resulting in a long-term, minor to moderate, beneficial impact.
- El Capitan Meadow is a river-related meadow within the 100-year floodplain of the Merced River. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has compacted meadow soils, altering the natural water recharge capabilities of the floodplain at this location. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to more resilient locations outside the floodplain of the Merced River. This could increase opportunities for restoration of natural floodplain characteristics, resulting in a minor, site-specific, long-term, beneficial effect.

Examples of how management elements proposed under this alternative could have negative effects on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- A long-term, minor, adverse impact to water quality could occur as a result of the continued and likely increase of nonpoint-source pollution discharge to stormwater runoff from roads, parking lots, and other impervious surfaces introduced into the area to accommodate visitor

use. If parking lots, roads, and other impervious surfaces were established where none currently exist, then vehicle-related pollutants and refuse would accumulate. This long-term, minor, adverse impact could be mitigated to a negligible level through the use of permeable surfaces and vegetated or natural filters or traps for filtering stormwater runoff. Other best management practices (Chapter II) for polluted runoff control include oil/sediment separators, street sweeping, and infiltration beds (soil capture of surface pollutants).

- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park could circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas could increase erosion and sedimentation to the river and its tributaries. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be negligible, since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Localized, short-term, minor, adverse impacts on water quality could occur from construction and demolition involving river impoundments, obstructions, or work within the river corridor. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade water quality. The application of construction/demolition best management practices (Chapter II) could lessen the potential for impacts to water quality. Implementation of a Storm Water Pollution Prevention Plan, as prescribed for all construction activities affecting over five acres (to be reduced to one acre in 2003) by the Environmental Protection Agency and the Regional Water Quality Control Board, would help to reduce potential short-term impacts on water quality due to construction activities. Storm Water Pollution Prevention Plans include best management practices for erosion control and containment of potential water quality pollutants. Such measures could reduce the potential adverse impacts to a negligible intensity.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on hydrology, floodplains, and water quality, depending on site-specific conditions and project design. If actions resulted in relocation outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal regulations (e.g., the Clean Water Act, Executive Order 11988 on floodplain management, and the *Floodplain Management Guidelines*).
- Relocation of facilities to other locations within the river corridor could have site-specific, long-term, negligible to major, adverse effects on hydrology, floodplains, and water quality, depending on site-specific conditions and project design. If actions resulted in relocation within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.

Although site-specific, short- and long-term, negative effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 3

would provide increased protection for these river processes and associated Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of hydrologic-process Outstandingly Remarkable Values of the gorge and El Portal include exceptionally steep gradients (2,000-foot elevation drop in approximately six miles) and continuous rapids. The majority of the Merced River gorge would be zoned 2A+, 2A, and 2B. El Portal would have a base zone of 2C, with large tracts zoned 3C. Examples of how the management elements of Alternative 3 would affect hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values of the Merced River Gorge and El Portal are provided below.

- Existing facilities, such as Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing the hydrologic processes of this river segment and resulting in minor to moderate, site-specific, long-term, beneficial effect. Minor, short-term, adverse effects to water quality (e.g., sedimentation, oil, grease) could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- The majority of the gorge is relatively inaccessible, and visitor use and facilities are unlikely to increase. Consequently, there would be no impact on hydrology, floodplains, or water quality for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with the natural hydrologic processes of the Merced River at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location, resulting in a site-specific, minor, beneficial effect.
- Portions of El Portal within the floodplain of the Merced River would be zoned 3C (e.g., Railroad Flat, old El Portal), which could allow additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., alteration of floodplain characteristics, alteration of hydrologic processes), minor to moderate, adverse effects on hydrology, floodplains, and water quality. Adverse impacts on water quality (e.g., sedimentation, oil, grease, fuels) would be related to construction (short-term) and use (long-term) of facilities. Adverse effects to the floodplain would be long term (i.e., building new facilities within the floodplain of the Merced River could alter water recharge rates or floodwater dissipation, or increase flood hazard on structures or individuals). Potential adverse impacts on hydrology and hydrologic processes could result from streambank stabilization (e.g., riprap) or channel modifications (e.g., rerouting the flow of the Merced River). These adverse effects to hydrology, floodplains, and water quality would be reduced to no impact or to a negligible to minor intensity by application of the criteria and considerations (including the Section 7 determination process), mitigation measures described in Chapter II (e.g., siting to avoid effects to floodplains, best management practices, oil and sediment separators), implementation of Executive Order 11988 on

floodplain management and the *Floodplain Management Guidelines*, and implementation of VERP management actions.

Repair or redevelopment of existing facilities (e.g., El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts of the proposed design on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values could include direct and permanent alteration of the floodplain, installation of fill or riprap within the Merced River, erosion and the long-term discharge of pollutants associated with use of the road (e.g., oil, grease, litter). These types of impacts would be long term, moderate to major, and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, Clean Water Act). Through these processes, project designs that avoid and minimize adverse effects to the Outstandingly Remarkable Values (including hydrologic processes) and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress, in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease, because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible intensity.

The application of management elements under this alternative would increase protection and enhancement of hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities within the floodplain of the Merced River that could have short- and long-term negative effects on hydrology, floodplains, and water quality. These impacts could be reduced to a negligible to minor intensity through the application of mitigation measures described in Chapter II, the criteria and considerations (including the Section 7 determination), and implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*.

Impacts in Wawona. Excellent water quality is listed as a hydrologic-process Outstandingly Remarkable Value of the impoundment above Wawona. No specific hydrologic-process Outstandingly Remarkable Values are listed for Wawona. The South Fork in Wawona would have a base zone of 2B. The 2B zone would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking that have the potential to adversely affect hydrology, floodplains, and water quality. Portions of facilities within the River Protection Overlay and floodplain of the South Fork, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. Such removal would allow natural

hydrologic processes to prevail at these locations, restore developed zones to natural floodplain, and reduce sources of water pollutants, thereby resulting in a long-term, minor, beneficial impact.

An example of an obstruction removal would be the replacement of Wawona Bridge. Design and construction of the bridge would have to conform to criteria to protect and enhance the Outstandingly Remarkable Values of the river, pursuant to Section 7 of the Wild and Scenic Rivers Act (see Chapter II, Site-Specific Elements Common to All Action Alternatives). Removal of the bridge would eliminate in-channel obstructions (bridge pilings) and channel constrictions (bank armament at the bridge abutments). Under Alternative 3, the River Protection Overlay would not allow further degradation of river conditions and would provide for enhancement of the free-flowing condition wherever possible in design and construction of the new bridge. This bridge could be replaced under the River Protection Overlay as an essential park facility, and the adjacent 2B zone would allow for primary roadways leading to the bridge crossing.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term, negligible to minor, adverse effects to water quality (e.g., pollutants associated with construction/demolition) could occur if facilities were removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 3 would have a long-term, negligible to minor, beneficial impact on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 3 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on flood hazards and hydrologic and geomorphic processes and related Outstandingly Remarkable Values within the river corridor, because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could alter floodplain characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay), in combination with the application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), would allow the hydrologic and geomorphic processes to remain relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, moderate, beneficial impact.

on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to hydrology discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect the watershed of the Merced River.

Past Actions. The Merced River has been historically affected by a variety of projects that have introduced obstructions into the river channel, modified the floodplain, and adversely affected water quality. Alterations to hydrology have occurred through development and use within the Merced River corridor since Euro-American settlement. Examples of projects that have had adverse effects on the hydrologic processes of the Merced River include bridges, riprap, removal of large woody debris, dikes, flood walls, impoundments, dams, and buildings.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects the water quality of the Merced River immediately adjacent to the roadway. The free-flowing condition of the Merced River has been adversely altered by direct placement of fill and riprap to widen and stabilize the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and by excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall short-term effects on water quality.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; (3) projects anticipated to have a net adverse effect; and (4) projects that would not affect the hydrological processes of the Merced River.

Examples of projects that could have a cumulative, beneficial effect on hydrological processes in the Merced River include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- South Fork Merced River Bridges Replacement (NPS)

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects on water quality), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, the net cumulative effect of these projects would be a long-term, beneficial impact on hydrological processes of the Merced River.

A reasonably foreseeable project that could have mixed adverse and beneficial effects on hydrological processes includes:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* has the potential to positively affect free flow of the Merced River by the proposed removal of the Cascades Diversion Dam. The *Yosemite Valley Plan* also has the potential to adversely affect water quality during construction activities related to Segment D of the El Portal Road Reconstruction Project (short-term), with the long-term, beneficial effect of improving water quality. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., effects to water quality). Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

However, some of the proposed redevelopment in El Portal (e.g., redevelopment of the sand pit), would be inconsistent with the management zoning in this alternative. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding.

In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on hydrological processes include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Yosemite Motels, El Portal (Mariposa Co.)

Cumulative effects of these potential future projects on the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term, minor, and beneficial.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that have potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on flood hazards, hydrologic and geomorphic processes, and related Outstandingly Remarkable Values within the river corridor because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects on hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could alter floodplain characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones in east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow the hydrologic and geomorphic processes to remain

relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, moderate, beneficial impact on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term, minor, and beneficial.

Wetlands

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wetland resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 3.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wetland-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and

use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native wetland and aquatic habitats). Although possible future actions, such as trail rehabilitation, could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are wetland-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values while providing a diverse visitor experience. Although portions of the east Valley would remain developed, the proposed zoning (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Upper River and Lower River Campgrounds) that have the potential to adversely affect native wetland and aquatic habitats. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive wetland habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging).

Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of these wetland habitats resulting in a site-specific, long-term, minor, beneficial impact.

- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., an upland location more resistant to impacts). This could increase opportunities for revegetation and restoration of natural wetland and aquatic habitats, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native wetland and aquatic habitats is correlated to the amount of facility removal and/or restoration. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside vegetation in Yosemite Valley, an Outstandingly Remarkable Value.
- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, including wetland and aquatic resources. The 2A and 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative:
 - Several facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
 - Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions.
 - Visitor access to the Merced River could be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected.
 - Large areas of sensitive habitats such as El Capitan Meadow would be zoned 2A and receive increased protection over current conditions.

If the above actions occur due to the 2A and 2B zoning, increased opportunities could exist for revegetation and restoration of wetland and aquatic resources (a biological resource Outstandingly Remarkable Value). Additional benefits to wetland and aquatic resources

could include reduced trampling, erosion, and compaction; reduced potential for introduction or spread of non-native species, reduced nonpoint-source pollutants; and reduced refuse. This could result in major, long-term, beneficial effects to wetland and aquatic resources. Incompatible facilities could be relocated elsewhere in the park or removed from the park altogether. Relocation of facilities to other locations within the park would have site-specific, long-term, negligible to major, adverse effects on wetland and aquatic resources, depending on site-specific conditions and project design. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures similar to those described in Chapter II (e.g., siting to avoid effects to sensitive habitats, compensation, best management practices, visitor education).

Examples of how management elements proposed under this alternative could have negative effects on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on wetlands, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on wetlands, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas would affect wetland resources at the site and increase erosion and sedimentation to the river. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be minor to negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Localized, minor, short-term, adverse, temporary effects on native wetland and aquatic habitats could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native wetland and aquatic habitats. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and

sediment separators, visitor education) could reduce the potential adverse impacts to native wetland and aquatic habitats to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 3 would provide increased protection for native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wetland-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+ and 2B and receive increased protection over the absence of zoning under the No Action Alternative. El Portal Trailer Village would be zoned 2B and could be removed as a result. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 3 would affect native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- The majority of the gorge is relatively inaccessible and visitor use is unlikely to change. Consequently, there would be no impact on wetland and aquatic habitats or wetland-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., radiating impacts from development), minor to moderate, adverse effects on native wetland and aquatic habitats. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts, long-term, minor to moderate, negative effects

to native wetland and aquatic habitats (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wetlands and wetland-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wetland-related Outstandingly Remarkable Values, other vegetation resources, such as upland scrub or woodlands, could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wetland-related Outstandingly Remarkable Values of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by visitors, and a nearly full range of riverine environments typical to the Sierra Nevada. The wilderness segments of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork, these management elements would limit the type of new facilities, such as large campsites with

facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native wetland and aquatic habitats) under the No Action Alternative. Although possible future actions, such as trail rehabilitation, could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. The South Fork in Wawona would have a base zone of 2B. The 2B zone would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day visitor parking that have the potential to adversely affect wetlands. Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated thereby increasing opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to wetland and aquatic habitats could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 3 would have a long-term negligible to minor beneficial impact on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 3 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wetland and aquatic habitats (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term,

negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, moderate, beneficial effects on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wetland and aquatic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wetland patterns (i.e., within the river corridor) as well as large-scale or regional wetland patterns.

Past Actions. Aquatic and riparian systems are the most altered and impaired habitats of the Sierra Nevada and are relatively rare in the context of the entire landscape. Wetlands in the Sierra Nevada have been drained since the earliest settlers attempted to “reclaim” meadows and other seasonally wet areas. Mountain meadows were commonly drained with the intent of improving forage conditions and to permit agriculture (Hughes 1934, as in NPS 1997b, University of California, Davis 1996). Development and activity in Yosemite National Park has reduced historic wet meadow acreage by 60-65%. Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, agriculture, buildings, campgrounds, and recreational features. Dams and diversions throughout most of the range have profoundly altered stream-flow patterns and water temperatures. Within the mountains, broad valleys with wide riparian areas were often reservoir sites, and much of the best former riparian habitat in the Sierra Nevada is now under water. The extent of the inundation across the range becomes apparent when one realizes that virtually all flatwater on the western slope of the Sierra Nevada below 5,000 feet is artificial (University of California, Davis 1996). These past actions have had long-term adverse effects on regional wetland and aquatic habitats.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wetlands of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wetlands include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, and Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- South Fork Merced River Bridges Replacement (NPS)

Although each of these projects may have site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wetlands. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wetland resources during construction (short-term), with the long-term,

beneficial effect of improving water quality through improved wastewater treatment. Another example is the update to the *Yosemite Wilderness Management Plan*, which could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wetlands include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term, beneficial impact to wetland resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature riparian vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional wetlands include:

- The Yosemite View parcel land exchange, El Portal (NPS)

- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional growth. Each of the aforementioned projects has the potential to have site-specific, adverse effects on wetland and aquatic resources during construction (short-term) and by direct displacement of resources (long-term). Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to wetland and aquatic resources, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement.

Wetland and riparian systems of the Merced River and the Sierra Nevada have been substantially altered by development and visitor activities. These changes have negatively influenced wetland size, form, and function and the plants, wildlife, and aquatic species that inhabit them. Cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wetlands include wetland restoration, rehabilitation projects, and ecosystem management. Cumulative adverse effects would be related to past, present, and reasonably foreseeable increased facilities, regional growth, and visitor demand. Several of these cumulative actions could have a long-term, beneficial effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor. However, throughout the Sierra Nevada and larger region, regional development and growth could have a net long-term, adverse effect on regional wetland and aquatic resources that would not be compensated by local or regional planning and restoration projects. Therefore, cumulative adverse effects on regional wetland and aquatic

habitats due to past, present, and reasonably foreseeable actions, could be major, adverse, and long term.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 3 could have a net long-term, major, adverse effect on regional wetland patterns.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wetland (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wetland and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wetland could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native wetland and wetland-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetland and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to have a long-term, major, adverse cumulative effect on regional wetland patterns. These cumulative actions in combination with Alternative 3 could have a long-term, major, adverse effect on regional wetland patterns.

Vegetation

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act, Clean Water Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to vegetation resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 3.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of vegetation-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation) under the No Action Alternative. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related

Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are vegetation-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values while providing a diverse visitor experience. Although portions of the east Valley would remain developed, the proposed zoning (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect native vegetation. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance native vegetation and vegetation related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., an upland location more resistant to impacts). This could increase opportunities for revegetation and restoration of natural wetland and aquatic habitats, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping

Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native vegetation is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside vegetation in Yosemite Valley, an Outstandingly Remarkable Value.

- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, including vegetation resources. The 2A and 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative:
 - Several facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
 - Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions.
 - Visitor access to the Merced River could be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected.
 - Large areas of sensitive habitats such as El Capitan Meadow would be zoned 2A and receive increased protection over current conditions.

If the above actions occur due to the 2A and 2B zoning, increased opportunities could exist for revegetation and restoration of vegetation resources (a biological resource Outstandingly Remarkable Value). Additional benefits to vegetation resources could include reduced trampling, erosion, and compaction; reduced potential for introduction or spread of non-native species, reduced nonpoint-source pollutants; and reduced refuse. This could result in major, long-term, beneficial effects to vegetation resources. Incompatible facilities could be relocated elsewhere in the park or removed from the park altogether. Relocation of facilities to other locations within the park would have site-specific, long-term, negligible to major, adverse effects on vegetation resources, depending on site-specific conditions and project design. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures similar to those described in Chapter II (e.g., siting to avoid effects to sensitive habitats, compensation, best management practices, visitor education).

Examples of how management elements proposed under this alternative could have negative effects on native vegetation and vegetation-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse affects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).

- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas would affect vegetation resources at the site and increase erosion and sedimentation to the river. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be minor to negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Localized, minor, short-term, temporary effects on native vegetation could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native vegetation. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to native vegetation to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 3 would provide increased protection for native vegetation and vegetation-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of vegetation-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+ and 2B and receive increased protection over the absence of zoning under the No Action Alternative. El Portal Trailer Village would be zoned 2B and could be removed as a result. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 3 would affect native vegetation and vegetation-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would

increase the free-flow condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).

- The majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on vegetation or vegetation-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., fire suppression in the vicinity of structures), minor to moderate, adverse effects on native vegetation. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to native vegetation (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native vegetation and vegetation-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the Act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance

and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of vegetation and vegetation-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect vegetation-related Outstandingly Remarkable Values, other vegetation resources (e.g., upland scrub or woodlands) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of vegetation-related Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by humans, and a nearly full range of riverine environments typical to the Sierra Nevada. The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. The South Fork in Wawona would have a base zone of 2B. The 2B zone would preclude new development such as interpretive centers, food services, campgrounds and

lodging, and day visitor parking that have the potential to adversely affect vegetation. Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated thereby increasing opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to vegetation could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 3 would have a long-term negligible to minor beneficial impact on native vegetation and vegetation-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 3 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, moderate, beneficial effects on vegetation and vegetation-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to vegetation discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local vegetation patterns (i.e., within the river corridor) as well as large-scale or regional vegetation patterns.

Past Actions. In general, vegetation patterns of the Sierra Nevada are relatively intact compared to other areas of California. Regional vegetation has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Portions of the Merced River and South Fork corridors within Yosemite National Park are relatively natural, especially in wilderness areas where use has had little effect on vegetation. Development and use of infrastructure within Yosemite Valley and throughout the Sierra Nevada have caused long-term, adverse alterations to native vegetation patterns since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects vegetation of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional vegetation include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)

- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native vegetation. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional vegetation include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect vegetation resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to vegetation resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could

cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional vegetation include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on vegetation resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native vegetation patterns. Regional population growth primarily affects regional vegetation patterns through

construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to vegetation, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, major, adverse effect on regional vegetation resources that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 3 could have a net long-term, major, adverse effect on regional vegetation patterns.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native vegetation and

vegetation-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 3 could have a long-term, major, adverse effect on regional vegetation patterns.

Wildlife

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wildlife resources that could occur within each segment of the Merced River corridor from application of management elements in Alternative 3.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wildlife-related Outstandingly Remarkable Values of the upper Merced River include riverine wildlife habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special-status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these

management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wildlife). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Yosemite Valley. Riparian areas and low-elevation meadows are the most productive communities in Yosemite Valley. The high quality and large extent of riparian, wetland, and other riverine areas provide rich habitat for a diversity of river-related species, including special-status species, neotropical migrant songbirds, and numerous bat species. These are examples of wildlife-related Outstandingly Remarkable Values within Yosemite Valley.

Yosemite Valley would be zoned to protect natural resources. Although portions of the east Valley would remain developed, the proposed zoning and River Protection Overlay (overall) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Cathedral Beach) that have the potential to adversely affect native wildlife. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, minor, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance (i.e., beneficial effect) native wildlife and wildlife-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to

remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for species likely to occur there, such as California newt and western aquatic garter snake, and would increase protection of potential California red-legged frog habitat (a wildlife-related Outstandingly Remarkable Value).

- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., to an upland location lacking high value resources that is more resistant to adverse impacts). This could increase opportunities for revegetation and restoration of natural vegetation and wildlife habitat, resulting in a minor to moderate, site-specific, long-term, beneficial effect to the wildlife habitat of El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native wildlife is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a minor to major, long-term, beneficial effect on streamside wildlife in Yosemite Valley, an Outstandingly Remarkable Value.
- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would provide greater protection of natural resources and opportunities for restoration and enhancement of wildlife habitats. The 2A and 2B zoning would promote river restoration and shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative.
 - Several existing facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed
 - Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions
 - Visitor access to the Merced River would be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected
 - Large areas of sensitive wetland and aquatic habitats such as El Capitan Meadow, Wosky Pond, and Bridalveil Bog would be zoned 2A and would receive increased protection over current conditions

If these actions were to occur under the 2A and 2B zoning, opportunities could increase for revegetation and restoration of wildlife, particularly riparian wildlife habitats (a biological resource Outstandingly Remarkable Value). These actions could also reduce trampling, erosion, and compaction; reduce the potential for introduction or spread of non-native species such as the bullfrog, or parasitic species such as the cowbird; reduce nonpoint-source pollutants; and reduce refuse. In addition, there would be a moderate, beneficial impact on the maintenance of connectivity between the various habitat types in the Merced River corridor. There would be a minor, beneficial impact in aquatic habitat structural elements, such as snags and down-and-dead and woody material in streams, as these would not be routinely removed for the safety of users of non-motorized watercraft, as had been the case previously.

Examples of how management elements proposed under this alternative could have negative effects on native wildlife and wildlife related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas would increase erosion and sedimentation to the river and its tributaries. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal regulations (e.g., the federal Endangered Species Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor to major, short-term, temporary effects on wildlife could occur from construction (e.g., new parking facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, noise, and introduction and spread of non-native species. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. The application of mitigation measures (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could lessen the potential for impacts to wildlife habitats (described in

Chapter II). Implementation of such measures could reduce the potential adverse impacts to a negligible to moderate intensity.

Although site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 3 would provide increased protection for native wildlife and wildlife-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wildlife-related Outstandingly Remarkable Values of the Merced River gorge include diverse riparian areas that are largely undisturbed by humans and river-associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2A, and 2B. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 3 would affect wildlife and wildlife-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment and fish habitat. This could increase opportunities for revegetation and restoration of riparian habitats, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value.
- The majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on wildlife or wildlife-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with riverine habitat and natural regeneration of riparian habitat at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed, which would allow for natural processes to prevail at this location, enhance the aquatic habitat (e.g., the removal of sources of pollutants would improve water quality and increase habitat values) and allow natural revegetation with riparian species. This could result in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, human presence, fire suppression in the vicinity of structures), minor to major, adverse effects on native wildlife. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, shielded lighting, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts to long-term, minor to moderate, negative effects to native wildlife (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wildlife and wildlife-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wildlife-related Outstandingly Remarkable Values, other wildlife resources, such as upland wildlife species (e.g., bears, deer) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wildlife-related Outstandingly Remarkable Values of wilderness segments of the South Fork include a nearly full range of riverine environments typical to the Sierra Nevada that are largely intact and undisturbed by humans. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog.

The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflect current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that

possibly could be built (potentially adversely affecting native wildlife), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, they would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian habitat based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Wawona. Examples of wildlife-related Outstandingly Remarkable Values of Wawona includes diverse riparian areas that are intact and largely undisturbed by humans. River-related federal and state special-status species in this segment include Wawona riffle beetle.

The South Fork in Wawona would have a base zone of 2B. The 2B zone would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking that have the potential to adversely affect hydrology, floodplains, and water quality. Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. This could increase opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

An example of an obstruction removal could be the replacement of Wawona Bridge. Design and construction of the bridge would have to conform to criteria to protect and enhance the Outstandingly Remarkable Values of the river pursuant to Section 7 of the Wild and Scenic Rivers Act (see Chapter II, Site-Specific Elements Common to the Action Alternatives). Removal of the existing bridge would eliminate in-channel obstructions (bridge pilings) and channel constrictions (bank armament at the bridge abutments). Under Alternative 3, the River Protection Overlay would not allow further degradation of river conditions and would petition for enhancement of the free-flowing conditions (a beneficial impact on the aquatic habitat) wherever possible in design and construction of the new bridge. This bridge could be replaced under the River Protection Overlay as an essential park facility, and the adjacent 2B zone would allow for primary roadways leading to the bridge crossing.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to wildlife could occur if facilities are removed from the River Protection Overlay. These

adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 3 would have a long-term negligible to minor beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 3 Impacts. For the duration of the plan, management zoning and the River Protection Overlay would preclude various types of new development that have the potential to adversely affect native wildlife (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor. These elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wildlife patterns (i.e., within the river corridor) as well as large-scale or regional wildlife patterns.

Past Actions. Wildlife communities have been manipulated almost since the beginning of the park. Regional wildlife has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Fur-bearing mammals were trapped by park rangers until 1925; lions were considered dangerous predators and controlled through the 1920s; bears were artificially fed as a tourist attraction until 1940. Natural wildfires, with their generally beneficial effects on wildlife habitat, were routinely suppressed until 1972 (Wuerthner 1994). Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

Yosemite's largest mammal, the grizzly bear, was extirpated from the region and from the state in the 1920s. Other mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by human activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including Yosemite National Park. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes.

Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Most fish currently found in the Merced River and its tributaries in Yosemite National Park have been introduced. Prior to trout stocking for sport fishing, native fish in Yosemite were probably limited to the rainbow trout and the Sacramento sucker, both of which were present only in the lower portions of the Merced River (i.e., Yosemite Valley and below). Rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or has displaced, the original strain.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wildlife of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wildlife include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wildlife. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wildlife include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco),
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)

- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wildlife resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to wildlife resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) wildlife, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Components of the *Yosemite Valley Plan* would need to change to conform with this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional wildlife include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)

- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native wildlife patterns. Regional population growth primarily affects regional wildlife patterns through construction (e.g., new housing and infrastructure) and human use. Examples of construction- and human-use-related effects on wildlife patterns include direct displacement of wildlife (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). More importantly, some of the projects provide for increased residential growth adjacent to the park and would accommodate increased recreational development. In total, regional development and growth could have a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. For the species at higher elevations, the effects are somewhat mitigated by resource protection planning and restoration. Although each new development is required to mitigate or compensate for adverse effects to wildlife, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate, adverse effect on regional wildlife resources that would not be compensated by regional planning and restoration projects discussed above.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be moderate, adverse, and long term.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wildlife (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions would be moderate, adverse, and long term.

Rare, Threatened, and Endangered Species

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be

managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to rare, threatened, and endangered species that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 3.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of biological resource Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, or endangered species). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, or endangered species and related Outstandingly Remarkable Values of the upper wilderness segment of the main stem Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows, a habitat for rare, threatened, or endangered species, based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are biological resource Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values while providing a diverse visitor experience. Although portions of the east Valley would remain developed, the proposed zoning (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in

the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect rare, threatened, or endangered species. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for special status-species likely to use wet meadows for foraging, such as western mastiff bat.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., an upland location more resistant to impacts). This could increase opportunities for revegetation and restoration of habitat for rare, threatened and endangered species, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow and a variety special-status species which are also Outstandingly Remarkable Values, such as great gray owl, foothill yellow-legged frog, and numerous bat species.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. Removal of obstructions may lead to seasonal creation of back-channel pools (a habitat niche now largely unavailable), which could improve conditions for native amphibians currently absent from the park, such as California red-legged frog. The magnitude of the effect of the River Protection Overlay on rare, threatened, and endangered species is correlated to degree to which it is implemented in the future. For example, removal

of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside habitats for river-associated rare, threatened, or endangered species in Yosemite Valley, an Outstandingly Remarkable Value.

- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, including habitat for rare, threatened, or endangered species. The 2A and 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative:
 - Several facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
 - Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions.
 - Visitor access to the Merced River could be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected.
 - Large areas of sensitive habitats such as El Capitan Meadow would be zoned 2A and receive increased protection over current conditions.

If the above actions occur due to the 2A and 2B zoning, increased opportunities could exist for revegetation and restoration of habitat for rare, threatened, or endangered species. Additional benefits to rare, threatened, or endangered species could include reduced trampling, erosion, and compaction; reduced potential for introduction or spread of non-native species, reduced nonpoint-source pollutants; and reduced refuse. This could result in major, long-term, beneficial effects to rare, threatened, or endangered species. Incompatible facilities could be relocated elsewhere in the park or removed from the park altogether. Relocation of facilities to other locations within the park would have site-specific, long-term, negligible to major, adverse effects on rare, threatened, or endangered species, depending on site-specific conditions and project design. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures similar to those described in Chapter II (e.g., siting to avoid effects to sensitive habitats, compensation, best management practices, visitor education).

Examples of how management elements proposed under this alternative could have negative effects on rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse affects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., federal Endangered Species Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated within the river

corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.

- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas would affect resources at the site (including potential habitat for special-status species) and increase erosion and sedimentation to the river. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be minor to negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Localized, minor, short-term, temporary effects on special-status species could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native habitats. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. Bridge removal could also adversely affect roosting bats (if present). The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to special-status species to a negligible intensity.

Although site-specific, short- and long-term, negative effects to rare, threatened, or endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 3 would provide increased protection for rare, threatened, or endangered species and related Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+ and 2B and receive increased protection over the absence of zoning under the No Action Alternative. El Portal Trailer Village would be zoned 2B and could be removed as a result. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 3 would affect native rare, threatened, and endangered species and related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Removal of obstructions may lead to seasonal creation of back-channel pools (a habitat niche now largely unavailable), which could improve conditions for native amphibians currently absent from the park, such as California red-legged frog. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- The majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on rare, threatened, and endangered species or related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation, such as blue elderberry—host plant for the Valley elderberry longhorn beetle. It may also adversely impact the recently identified population of Cogdon’s woolly sunflower at this site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, noise, fire suppression in the vicinity of structures), minor to moderate, adverse effects rare, threatened, and endangered species. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to rare, threatened, and endangered species (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse

effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of rare, threatened, and endangered species and related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect river-related rare, threatened, and endangered species (Outstandingly Remarkable Values), other rare, threatened, and endangered species (e.g., upland rare, threatened, and endangered species) would be mitigated for during consultation with the U.S. Fish and Wildlife Service pursuant to the federal Endangered Species Act.

Impacts in Wilderness Segments of the South Fork. Examples of biological resource Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by humans, and a nearly full range of riverine environments typical to the Sierra Nevada. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog. The upper (above Wawona) and lower (below Wawona) portions of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, and endangered species), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, and endangered species and related

Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. The South Fork in Wawona would have a base zone of 2B. The 2B zone would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day visitor parking that have the potential to adversely affect rare, threatened, and endangered species. Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated thereby increasing opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to rare, threatened, and endangered species could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 3 would have a long-term negligible to minor beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 3 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on rare, threatened,

and endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to rare, threatened, and endangered species discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region. The intensity of impact depends on whether the impacts are anticipated to interact cumulatively. For example, factors external to the park, such as broad regional habitat degradation and pesticide use, can combine with existing, in-park impacts, such as non-native species, to cause declines in rare, threatened, or endangered amphibians (e.g., mountain yellow-legged frog and Yosemite toad), an adverse, cumulative impact. The projects identified below include those projects that have the potential to effect populations of rare, threatened, or endangered species (i.e., within the river corridor) as well as large-scale or regional populations of the same species.

Past Actions. Natural habitats have been manipulated almost since the beginning of the park. Regional wildlife and vegetation patterns have been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by visitor activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Past and ongoing activities that affect rare, threatened, or endangered species include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects habitats immediately adjacent to the roadway. Special-status species with potential to be affected during construction include Valley elderberry longhorn beetle, roosting bats, peregrine falcon, and Tompkin's sedge. Special-status roosting bats could be affected, primarily through the noise generated by construction equipment and blasting. Blasting is also a concern for the peregrine falcon, known to occur at the Cascades aerie in the project vicinity (the peregrine was recently delisted but continues to be a species of concern in the park). Adverse effects to these species are avoided or minimized during construction by implementation of a compliance monitoring program, pre-construction surveys, erosion and sediment controls, minimizing noise during sensitive biological periods, construction timing restrictions, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional rare, threatened, or endangered species include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional rare, threatened, or endangered species. For

example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional rare, threatened, and endangered species include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect rare, threatened, and endangered species during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to rare, threatened, and endangered species by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be

required to conform to the management zones provided in Alternative 3. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional rare, threatened, and endangered species include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on rare, threatened, and endangered species during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including rare, threatened, and endangered species. Regional population growth primarily affects regional rare, threatened, and endangered species through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on rare, threatened, and endangered species include direct displacement of rare, threatened, and endangered species (e.g., nest trees removed and replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., the spread of yellow star thistle by construction equipment and its subsequent adverse impacts on special status plant species), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to rare, threatened, and endangered

species, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate to major (depending on species-specific impacts), adverse effect on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have long-term, moderate to major (depending on species-specific impacts), adverse cumulative impacts on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above. These cumulative actions in combination with Alternative 3 could have a net long-term, major, adverse effect on regional rare, threatened, and endangered species.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably future actions are likely to increase regional growth (construction and human-use-related effects)

and have a long-term, major, adverse cumulative effect on regional rare, threatened, and endangered species (e.g., introduction and spread of non-native species, direct displacement of habitat by structures). These cumulative actions in combination with Alternative 3 could have a long-term, major, adverse effect on regional rare, threatened, and endangered species.

Air Quality

Analysis

General Impacts. As a general matter, under Alternative 3, air quality in the corridor would continue to be influenced by local sources within the park and by regional sources upwind of the park. The differences between air quality conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 3, “air quality” would be eliminated as an Outstandingly Remarkable Value along all river segments; construction or demolition activities could occur; and the number of campsites and day-visitor parking spaces could be reduced.

Under Alternative 3, air quality would be removed from the list of Outstandingly Remarkable Values along all segments of the main stem of the Merced River and the South Fork within the park. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Air quality has been removed as an Outstandingly Remarkable Value because it is not river-related nor is it unique in the region or nation. However, the removal would not affect air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value. Emissions sources in the park would continue to be regulated pursuant to applicable provisions of the federal Clean Air Act, local air district *Rules and Regulations*, park campfire regulations, the *Fire Management Plan*, and state and federal motor-vehicle emissions control programs.

Under this alternative, some limited facilities could be constructed and other facilities removed based on the new management zoning designations. Potential construction or demolition activities could generate substantial amounts of dust (including PM-10 and PM-2.5), primarily from “fugitive” sources (i.e., emissions released through means other than through a stack or tailpipe), and lesser amounts of other criteria air pollutants, primarily from operation of heavy equipment. Dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, construction activities could result in significant quantities of dust, and, as a result, local visibility and PM-10/PM-2.5 concentrations could be adversely affected. Without mitigation, dust raised by construction or demolition activities would have a major but temporary effect in the immediate vicinity of individual sites.

Best management practices are available to reduce construction- and demolition-related air quality impacts and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. Generally, these practices include

watering active construction areas; covering trucks hauling materials that could spill onto paved surfaces; sweeping (with water sweepers) paved areas that are subject to vehicle traffic and on which soil materials have been deposited; stabilizing inactive construction areas; covering stockpiles; limiting vehicle speeds on unpaved areas; installing erosion control measures; and timely revegetation. All of these measures would not apply at each construction or demolition site. Generally, larger, more intensive construction or demolition projects require more comprehensive dust abatement programs than smaller, less intensive projects. Implementation of the best management practices would reduce the temporary and localized air quality impacts from construction or demolition activities to a minor level.

Under Alternative 3, the number of campsites and day-visitor parking spaces could be reduced relative to Alternative 1, because some campsites and parking spaces would be located in areas in which they would be inconsistent with the new zone designations. The reduction in the number of campsites would have a local, minor, long-term, beneficial effect by reducing the number of campfires and related emissions within the Valley and in Wawona on the typically busy days when the campgrounds would be full. If parking areas were simply removed from the corridor and not relocated, long-term air quality in the Valley would be adversely affected by increased vehicular congestion from visitors searching for remaining parking spaces or parking in nondesignated areas. Such congestion would lead to a local, minor, long-term, adverse impact due to the localized concentration of vehicular emissions.

Summary of Alternative 3 Impacts. Under Alternative 3, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value and since emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with site-specific construction or demolition activities within the corridor. Over the long term under this alternative, the number of campsites could be reduced, which would result in a local, minor, beneficial effect by reducing the number of campfires and related emissions within the Valley and in Wawona on the typically busy days when the campgrounds would be full. Also, over the long term, the number of day-visitor parking spaces could be reduced, which could result in a local, minor, adverse effect due to increased vehicular congestion (and related emissions) from visitors searching for remaining parking spaces or parking in nondesignated areas.

Cumulative Impacts

Cumulative effects to air quality discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect air quality within the river corridor or that could be affected by air pollutant sources within the river corridor.

Past Actions. Since 1950, the population of California has tripled, and the rate of increase in vehicle-miles-traveled has increased six-fold. Air quality conditions within the park have been

influenced by this surge in population growth and its associated emissions from related industrial, commercial, and vehicular sources in upwind areas as tempered by a burgeoning regulatory apparatus. Since the 1970s, emissions sources operating within the park, as well as California as a whole, have been subject to local stationary-source controls and state and federal mobile-source controls. With the passage of time, such controls have been applied to an increasing number of sources, and the associated requirements have become dramatically more stringent and complex. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles and their related emissions until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The 1990 *Fire Management Plan* was developed to address management issues related to prescribed natural burns, prescribed burns, and wildfires in the park. Implementation of the smoke management policies of the 1990 *Fire Management Plan* reduces the potential for burns or wildfires to have a major effect on air quality in the park or in the park vicinity.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both negative (short-term during construction) and potentially beneficial (long-term) effects on air quality. Short-term, construction-related effects include dust and other pollutant emissions associated with operation of construction equipment, earthmoving activities, and vehicle travel over unpaved surfaces. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which could have a long-term, beneficial impact by reducing automobile trips.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects not anticipated to have a net adverse or beneficial, long-term effect.

Examples of projects that could have a cumulative, beneficial, long-term effect on air quality include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park.
- The San Joaquin Corridor Rail Projects (DOT, Amtrak) would contribute to a long-term, beneficial impact on air quality because such improvements would encourage travel by alternative (non-private vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resources Management Building (NPS) are two projects that would reduce work/home commutes for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding

orientation and interpretation services. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. However, it is acknowledged that this consolidated parking facility at Yosemite Village is not compatible with the management zones of Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, these projects would have beneficial impact by reducing traffic congestion and related emissions in Yosemite Valley.

- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Reconstruction Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term, major, adverse impacts on local air quality primarily due to dust from construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle emissions.
- Several other regional projects that will have a net beneficial effect on air quality by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS) and the Expansion of Mariposa County Transit System.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would have a beneficial, long-term effect on air quality.

Reasonably foreseeable future actions that could have an adverse effect on air quality include:

- Revisions to the 1990 *Yosemite Fire Management Plan* and development of the U.S. Forest Service's *Fire Management Action Plan for Wilderness*, which could lead to increased use of prescribed burning techniques
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects, the A-Rock Reforestation, the Fire Management Action Plan for Wilderness (USFS, Stanislaus), and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The Wawona Campground Improvement (NPS)
- Various development-related projects such as the Mariposa County General Plan Update; Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); and the Buildout of City of Merced, General Plan

- The Highway 41 Extension (Madera Co.), which would not be a land use development project but would remove an obstacle to land use development (and associated emissions) in the fast-growing area north of Fresno

Revisions to the 1990 *Yosemite Fire Management Plan*, the development of the *Fire Management Action Plan for Wilderness* (USFS, Stanislaus), and the fuels and reforestation projects could lead to increased use of prescribed burning techniques and could have an intermittent, long-term, adverse effect on local and regional air quality and visibility, depending upon the extent to which these projects protect air resources. The Wawona Campground Improvement (NPS) would construct additional campsites, which could result in increased local emissions from campfires, unless the overall project (which would also involve rehabilitation of an existing campground) provides for group fire rings, rather than fire rings at each campsite.

Cumulative growth in the region, and the transportation projects such as the Highway 41 Extension (Madera Co.) that support cumulative growth would have localized, short-term, construction-related impacts; over the long term, these projects would generate emissions of ozone precursors and particulate matter primarily due to associated motor vehicle trips.

Reasonably foreseeable future actions not anticipated to have a net adverse or beneficial effect on air quality, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); and South Fork Merced River Bridges Replacement (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration Project (NPS); update to the Yosemite Wilderness Management Plan (NPS); Tamarack Campground Rehabilitation (NPS); Bridalveil Horse Camp Rehabilitation (NPS); Yosemite Creek Campground Rehabilitation (NPS); and the South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM)
- Land exchanges, such as Yosemite View Parcel Land Exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on air quality due to construction activities, and, in some cases, these effects would occur within the corridor. With respect to long-term effects, a distinction can be made between ozone and particulate matter. For ozone, regional emissions trends suggest that the combination of the beneficial effect of ongoing regional, state, and federal regulatory controls (particularly mobile source control programs) with the adverse effect of existing and future land use development and associated stationary, area, and mobile emissions sources, would result in a regional, moderate, beneficial effect. That is, the beneficial effect of past and present actions that regulate stationary and mobile emissions sources and reasonably foreseeable future actions that have the potential to reduce vehicle trips and vehicle-miles-traveled would offset the adverse effect of ozone precursor emissions associated with increased cumulative growth in the region, leading to a gradual improvement in ozone air quality.

For particulate matter, the net cumulative effect is more difficult to determine, since ambient concentrations of particulate matter reflect primary (i.e., directly emitted) particles as well as

secondary (i.e., derived through photochemical reactions involving precursor pollutants) particles derived from emissions of volatile organic compounds, nitrogen oxides, and sulfur oxides. One of the principal sources of directly emitted particles is entrainment of dust by vehicles moving over paved roads, and this component of particulate matter would increase in proportion to increases in vehicle-miles-traveled associated with cumulative growth. One of the secondary sources of particulate matter, sulfur oxides, would also continue to increase with cumulative growth. In contrast, as discussed above in connection with ozone, emissions of volatile organic compounds and nitrogen oxides would continue a downward trend despite cumulative growth, and thus, their contribution to particulate matter concentrations would diminish. Furthermore, unlike ozone, which is considered a regional pollutant, particulate matter reflects both local and regional sources, and the relative influence of these two basic types of sources changes from day to day. Thus, given the opposing emissions trends and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the cumulative effect relative to particulate matter would be beneficial or adverse; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Alternative 3 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 3 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term, adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 3; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary from day to day and season to season. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 3 would be beneficial or adverse with respect to particulate matter air quality; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Conclusions

Under Alternative 3, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, because no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value and because emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with construction or demolition activities within the corridor. Over the long term under this alternative, the number of campsites could be reduced, which would result in a minor, local, beneficial effect by reducing the number of campfires and related emissions within the Valley and in Wawona on the typically

busy days when the campgrounds would be full. Also, over the long term, the number of day-visitor parking spaces could be reduced, which could result in a minor, local, adverse effect due to increased vehicular congestion (and related emissions) from visitors searching for remaining parking spaces or parking in nondesignated areas.

Alternative 3 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 3 would not occur in the vicinity of and at the same time as cumulative construction projects; thus, the local, short-term, adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 3; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary on a daily and seasonal basis. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 3 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Noise

Analysis

General Impacts. As a general matter, under Alternative 3, the acoustical environment in wilderness areas would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights, and the acoustical environment in non-wilderness areas would continue to be influenced by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. The differences between noise conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 3, “natural quiet” would be eliminated as an Outstandingly Remarkable Value along certain river segments, and construction or demolition activities could occur.

Under Alternative 3, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along those segments of the main stem of the Merced River (wilderness) and the South Fork (wilderness and below Wawona) for which “natural quiet” is currently listed as an Outstandingly Remarkable Value. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Natural quiet has been

removed as an Outstandingly Remarkable Value because it is not river-related nor is its presence in the corridor unique to the region or nation.

However, the removal would have a local, negligible, long-term, adverse effect on noise, since one important aspect of this environmental condition—the enjoyment of natural river sounds—has been integrated into the recreation Outstandingly Remarkable Values for each of the three applicable river segments. As such, that particular aspect would continue to be considered for both protection and enhancement. Also, for the two segments in designated Wilderness areas, noise sources would continue to be regulated through implementation of policies contained in the 1989 *Wilderness Management Plan*, such as the wilderness permit system and restrictions on aircraft and snowmobile use. Although the third river segment for which “natural quiet” would no longer be an Outstandingly Remarkable Value (below Wawona) would not be located in a designated Wilderness area, it would be designated 2A+ under this alternative; this designation would essentially eliminate the potential for noise impacts since, as undeveloped open space, new development and related noise sources would generally not be allowed.

The application of management zones under this alternative would ensure that essentially no new human-caused noise sources would be introduced along segments of the corridor that would lie in wilderness areas. Thus, Alternative 3 would have essentially no effect on the noise environment in wilderness areas.

In non-wilderness areas under this alternative, some limited facilities could be constructed and other facilities removed based on the new management zoning designations. Construction or demolition activities could generate substantial amounts of noise during the temporary construction period. The noise levels generated by typical pieces of construction equipment are shown in table IV-1 under Alternative 2.

At each individual construction or demolition site, the related noise impact would vary depending upon a number of factors, such as the number and types of equipment in operation on a given day, their usage rates, the level of background noise in the area, and the distance between sensitive uses and the construction site. However, in general, given the low background noise levels away from park roadways and the expectation of visitors that the environment be free of excessive noise sources (if not natural quiet), the impact from construction or demolition activities would generally be local, major, short-term, and adverse.

Best management practices are available to reduce noise impacts from equipment associated with construction or demolition activities and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. With each individual construction or demolition project, these best management practices would need to be refined and balanced against other resource goals, such as protection of wildlife. Implementation of best management practices would generally reduce the related impacts from major to moderate, given the temporary nature of construction or demolition projects.

Summary of Alternative 3 Impacts. Under Alternative 3, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on

noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness Management Plan*; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 3, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Under Alternative 3, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Also, Alternative 3 would accommodate a gradual increase in annual visitation, which would lead to a local, minor, long-term, adverse effect along the various roads that traverse the corridor in non-wilderness areas.

Cumulative Impacts

Cumulative effects to the ambient noise environment discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect noise within the river corridor or could be affected by noise sources within the corridor.

Past Actions. Development of facilities that include various sources of noise has occurred in and near some segments of the river corridor. Such facilities include roadways, campgrounds, and administrative buildings. Generally, these facilities were developed with limited consideration of potential noise impacts. From a regulatory standpoint, relevant state and federal noise standards typically apply to individual types of noise sources, such as automobiles and buses, rather than to overall noise levels, but the National Park Service has adopted two plans, a Restricted Access Plan and the *Wilderness Management Plan*, that indirectly affect overall noise levels in the river corridor. The Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the indirect effect of limiting the amount of vehicle noise during peak periods by restricting the number of incoming vehicles until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The *Wilderness Management Plan* was developed to preserve a wilderness environment in which the natural world along with the processes and events that shape it are largely untouched by human interference. Implementation of the permit system for overnight camping under the *Wilderness Management Plan* reduces potential noise impacts in those areas where natural quiet is an important element of the visitor experience.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on noise. Short-term, construction-related effects include noise from heavy equipment operations. Current safety

improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which may have a long-term, beneficial impact by replacing automobile trips with a fewer number of transit vehicle trips, depending upon transit ridership levels and the technology used for transit vehicles.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects anticipated not to have a net adverse or net beneficial, long-term effect.

Cumulative projects that could have a net, beneficial, long-term effect on the ambient noise environment include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion.
- Passenger rail improvements in the Amtrak San Joaquin Corridor (DOT, Amtrak) and potential creation of high-speed rail service would encourage travel by alternative (nonprivate vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resources Management Building (NPS) are two projects that would reduce in-Valley vehicle trips for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. However, it is acknowledged that this consolidated parking facility at Yosemite Village is not compatible with the management zones of Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, these projects would have beneficial impact by reducing traffic congestion and related noise in Yosemite Valley.

- Several other regional transportation projects that would have a net beneficial effect on noise by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS), and the Expansion of Mariposa County Transit System (Mariposa Co.).
- Update to the National Park Service's 1989 *Yosemite Wilderness Management Plan*.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would therefore have a beneficial, long-term effect on the ambient noise environment.

To the extent that the transportation-related projects cited above would replace automobile trips in the Valley with bus trips, the anticipated beneficial effect would depend upon ridership levels (and the corresponding number of automobile trips that would be avoided) and the technology selected for the buses. While a bus generates higher maximum noise levels than an automobile, a shift from auto to bus trips would reduce average roadside noise levels, assuming a certain number of auto trips would be displaced. For instance, a typical diesel-powered bus generates the same amount of noise as approximately 6 to 50 typical automobiles at speeds of 40 miles per hour or less (the difference between bus and auto noise is inversely related to speed), based on data compiled by the U.S. Department of Transportation (FHWA 1995). Assuming that a typical electric bus generates approximately 6 dBA less than a typical diesel bus, an electric bus generates the same amount of noise as approximately 2 to 13 typical automobiles. Thus, these projects have the potential to contribute to a cumulative beneficial effect in the Valley but also have the potential to offset some of the benefit with a combination of low ridership levels and typical diesel bus technology.

Implementation of an update to the *Yosemite Wilderness Management Plan* (NPS) would have a net beneficial, long-term effect on the ambient noise environment in the Merced River corridor because of the emphasis on improving visitor use management as it relates to naturally functioning ecosystems and a quality diverse wilderness experience.

Cumulative projects that could have a net, adverse, long-term effect on the ambient noise environment include:

- Various development-related projects, such as the Mariposa County General Plan Update (Mariposa Co.); Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan
- Wawona Campground Improvement (NPS)

Cumulative growth in the region would have localized, short-term, construction-related impacts; over the long term, these projects would have an adverse effect on local roadside noise levels due to increased vehicle trips. The Wawona Campground Improvement project would construct an additional campground, which may result in increased noise in Section 35.

Reasonably foreseeable projects not anticipated to have a net adverse or beneficial effect on the ambient noise environment, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); South Fork Merced River Bridges Replacement (NPS); El Portal Road Improvement Project (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration; Bridalveil Horse Camp Rehabilitation; and Yosemite Creek Campground Rehabilitation (NPS)
- Land exchanges, such as Yosemite View Parcel Land Exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camps, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on the ambient noise environment due to construction activities, and in some cases, these effects would occur within the corridor. Over the long-term, statewide growth and development would accelerate the national trend in increased air travel, resulting in a local, minor, long-term adverse effect in some portions of the corridor in wilderness areas due to increased aircraft overflights and associated intrusive noise levels. In non-wilderness areas, cumulative actions that would provide for increased transit use and reduced automobile use or that would reduce vehicle trips in the Valley could result in a local, minor, long-term, beneficial effect within the corridor depending upon the type of technology used for transit purposes and the extent to which private automobile trips are diverted to transit.

Alternative 3 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 3 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 3; as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the gradual increase in annual visitation to the park would likely offset the beneficial effects of those cumulative actions that would tend to reduce vehicle trips and their associated noise, resulting in a net local, minor, long-term, adverse effect on noise levels in those portions of the corridor through which roadways traverse.

Conclusions

Under Alternative 3, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness*

Management Plan; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 3, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Under Alternative 3, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Also, Alternative 3 would accommodate a gradual increase in annual visitation, which would lead to a local, minor, long-term, adverse effect along the various roads that traverse the corridor in non-wilderness areas.

Alternative 3 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 3 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term, adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long-term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 3; as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the gradual increase in annual visitation to the park would likely offset the beneficial effects of those cumulative actions that would tend to reduce vehicle trips and their associated noise, resulting in a net local, minor, long-term, adverse effect on noise levels in those portions of the corridor through which roadways traverse.

Cultural Resources

General Impacts. Cultural resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those cultural resources that are not related to the Merced River, are not unique to the region or nation, or do not accurately reflect site conditions have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, 1999 Programmatic Agreement), as well as by federal law (e.g., National Historic Preservation Act and Archeological Resources Protection Act).

Cultural resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include river-related cultural resources that are either eligible for or listed in the National Register of Historic Places that are not intended to divert the free flow of the river. The revised Outstandingly Remarkable Values are more inclusive than those in the 1996

Draft Yosemite Valley Housing Plan and provide greater focus on the Merced River and resources unique to the region or nation.

Archeological Resources

Analysis

Under the application of management elements for Alternative 2, there is a potential that earthmoving activities would be required as part of construction and/or development. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The proposed management zoning designations for the wilderness areas of the Merced River corridor would not allow for development of any new facilities. Therefore, impacts to archeological resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to adversely affect entire sites or portions of sites by disturbing intact archeological resources, which are identified as an Outstandingly Remarkable Value. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected. These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. Where such avoidance were not feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

Yosemite Valley. Zoning designations under this alternative, such as the 2A, 2B, and 2C zones, could allow for construction of new facilities and hardened surfaces (e.g., trails, parking areas, restrooms, and picnic areas) and for the removal or relocation of existing facilities within the 2A and 2C zones. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed and possibly destroyed. Development within these management zones also could concentrate visitor use in the Valley, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. Although the intensity of the impact would depend partly upon the nature and location of the undertaking, extensive grading and ground disturbance could result in a local, long-term, minor to moderate, adverse impact to archeological resources.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, the park would conduct data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact. Every effort would be made to avoid adverse impacts wherever possible. Where such avoidance would not be or prudent, the park

would implement data recovery excavations in accordance would not be the park's 1999 Programmatic Agreement, thereby reducing the intensity of the impact.

Merced River Gorge. Under Alternative 3, the zoning designations could allow for construction of facilities, such as trails, parking areas, restrooms, and picnic areas within the Merced River gorge. If such construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. These potential actions also could concentrate visitor use, thereby resulting in impacts such as trampling, surface collection, and erosion. However, by establishing a site monitoring program and by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, reducing the likelihood of visitor-related damage. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological sites would be avoided wherever possible. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

El Portal. The 3C zone could allow for the development of facilities or the removal of existing facilities. If this development or removal occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The 2B zone could allow construction of new facilities and hardened surfaces and the removal or relocation of existing facilities. Development within this management zone also could concentrate visitor use at specific locations in El Portal, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered to be a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with the stipulations in the park's 1999 Programmatic Agreement. Every effort would be made to avoid adverse impacts in design. Should avoidance prove impossible, data recovery excavations carried out in accordance with the park's 1999 Programmatic Agreement would retrieve important scientific information, thereby reducing the intensity of the impact.

Wawona. Under Alternative 3, the zoning designations allow for the potential development, maintenance, rehabilitation, or removal of facilities in the Wawona area. If these activities occurred and earthmoving activities were required, intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological resources would be avoided wherever possible. Where such would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

Summary of Alternative 3 Impacts. The implementation of potential future actions under the management zones of Alternative 3 would result in a long-term, major, adverse impact to archeological resources due to potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value. The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Cumulative Impacts

Cumulative impacts to archeological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect archeological resources within the river corridor or in the park vicinity.

Past Actions. Archeological resources are subject to damage from development, vandalism, visitor access, and natural processes. For example, the 1997 flood exposed portions of two archeological resources in El Portal.

In general, the archeological resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous archeological resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. There are archeological resource sites in Yosemite Valley, El Portal, and Wawona that are considered to be at risk from existing facility development. These sites are at or adjacent to trails, structures, utility systems, and other facilities and are subject to ongoing disturbances such as trampling, surface collection, and ground disturbance associated with facility maintenance.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on archeological resources in the vicinity include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- The *Yosemite Valley Plan* (NPS)
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- South Entrance/Mariposa Grove Site Planning (NPS)
- Resources Management Building, Yosemite West Rezoning Application, South Fork Merced River Bridges Replacement (NPS)
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS), Hazel Green Ranch (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI), Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek

Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)

- Merced River Canyon Trail Acquisition (BLM)

The extensive grading and ground disturbance that could be required for these projects could disturb individual archeological resources. Each of these projects is within an archeologically sensitive area, such as a river valley or a mountain meadow. Specific impacts would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The preferred alternative of the *Yosemite Valley Plan* would result in development actions in Yosemite Valley that would require earthmoving activities. However, it is acknowledged that some of this potential development in Yosemite Valley is not compatible with the management zones of Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, major, adverse impact on archeological resources.

Conclusions

The implementation of potential future actions under the management zones of Alternative 3 would result in a long-term, major, adverse impact to archeological resources due to the potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value. The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on archeological resources.

Ethnographic Resources

Analysis

Under the application of management elements for Alternative 3, there is a potential that ethnographic resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The zoning designations for wilderness areas of the Merced River corridor would not allow for the development of any new facilities. Therefore, impacts to ethnographic resources would occur only as a result of ongoing park operations and programs, such as facilities

maintenance and repair. Since the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected, it is not possible to determine the intensities of those impacts.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement and the cooperative agreement for traditional uses. Every effort would be made to avoid adverse impacts to ethnographic sites. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Yosemite Valley. The zoning designations under Alternative 3 could result in development of new facilities and hardened surfaces (e.g., trails, parking areas, restrooms, and picnic areas) and removal and relocation of existing facilities. If these actions were to occur, then ethnographic resources, which are identified as an Outstandingly Remarkable Value, could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

Any such action would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. The park, in consultation with the culturally associated Indian tribes, would make every effort to avoid impacts to ethnographic resources. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

The general increase in visitors to the park would increase the potential that American Indians would be discouraged from using traditional gathering areas within the Valley. However, this alternative would provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas. Compared to Alternative 1, this alternative would reduce the likelihood of impacts to ethnographic resources and would provide a long-term, minor, beneficial impact.

The River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would have a long-term, moderate, beneficial impact on ethnographic resources by improving conditions for the recovery of traditionally used plants.

Merced River Gorge. The zoning designations in the Merced River gorge could allow for construction of facilities, such as trails, parking areas, restrooms, and picnic areas, at the Cascades area. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

El Portal. The zoning designations for portions of the river corridor in El Portal could allow for development of new facilities, construction of other facilities (e.g., trails, parking areas, restrooms, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Wawona. The zoning designations for portions of the river corridor through Wawona could allow for ongoing maintenance and rehabilitation of facilities, construction of other facilities (e.g., trails, parking areas, restrooms, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature,

location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Summary of Alternative 3 Impacts. Alternative 3 could provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas, and the River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential future actions that could occur under the management zones of Alternative 3, which is considered to be a local, long-term, minor to major, adverse impact.

Cumulative Impacts

Cumulative impacts to ethnographic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect ethnographic resources within the river corridor or in the park vicinity.

Past Actions. Ethnographic resources and their traditional cultural associations have been lost or damaged in Yosemite National Park through past development, visitor use, natural events, and widespread disruption of cultural traditions. Nevertheless, Yosemite National Park retains many sites and resources of significance to local and culturally associated American Indians.

In general, the ethnographic resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous ethnographic resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within

the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. No present actions have been identified that would affect ethnographic resources in the vicinity of the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects that could adversely affect ethnographic resources; (2) projects that could beneficially affect ethnographic resources; and (3) projects that could either adversely or beneficially affect ethnographic resources.

Examples of projects that could have a cumulative, adverse effect on ethnographic resources include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Various development-related projects such as, the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); and Resources Management Building (NPS)
- Merced River Canyon Trail Acquisition (BLM)

All of these projects could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places. These projects would have a long-term, adverse impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were damaged and access to traditional use places were facilitated.

Reasonably foreseeable projects that would beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

These projects could result in restoring native plant habitat, which would be a long-term, beneficial impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were restored and access to traditional use places were facilitated.

Reasonably foreseeable projects that would adversely or beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- The *Yosemite Valley Plan* (NPS)

The preferred alternative of the *Yosemite Valley Plan* could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places, and could beneficially affect ethnographic resources by restoring native plant habitat. However, it is acknowledged that some of this potential development in Yosemite Valley is not compatible with the management zones of Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding.

The cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact on ethnographic resources because the long-term, beneficial impacts associated with the management of natural resources and river processes in the vicinity of the Merced River corridor would be partially offset by the long-term, adverse impacts associated with damaging gathering sites or restricting access to traditional use places.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Conclusion

Alternative 3 could provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas, and the River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential future actions that could occur under the management zones of Alternative 3, which is considered to be a local, long-term, minor to major, adverse impact.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Cultural Landscape Resources, including Historic Sites and Structures

Analysis

Under the application of management elements for Alternative 3, there is a potential that cultural landscape resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The management zoning designations for the wilderness areas of the Merced River corridor would not allow development of new facilities. Therefore, impacts to cultural landscape resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to adversely affect cultural landscape resources, which are classified as an Outstandingly Remarkable Value. Impacts would be associated with maintenance activities that remove historic fabric, remove historic structures, or add incompatible facilities within or adjacent to historic structures. The intensity of impact would depend upon the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that are affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening

and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Yosemite Valley. The Merced River, its adjacent riparian corridor and meadows, and viewsheds are considered to be important elements of the Yosemite Valley cultural landscape historic district. The management zones and the River Protection Overlay could allow for the protection and enhancement of these elements of the cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in protecting and/or enhancing the character-defining features of a historic property, and the number of contributing elements of a historic district that were protected and/or enhanced.

The management zoning designations for portions of the river corridor in Yosemite Valley could result in the development of new facilities (e.g., campgrounds, trails), the relocation of facilities (e.g., trails, restrooms), or the removal of facilities (e.g., campgrounds). Implementation of the River Protection Overlay, in combination with the management zones, would allow for the removal or redesign of bridges; however, the historic automobile and footbridges (e.g., Stoneman Bridge, Sugar Pine Bridge, Housekeeping Bridge) are considered to be Outstandingly Remarkable Values, and any future proposal for removal or redesign would be subject to the Section 7 process. Any of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the Valley wide cultural landscape, result in the removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Merced River Gorge. The management zoning designations under Alternative 3 would allow for construction or removal of facilities (e.g., trails, parking areas, restrooms, Cascades residences, and picnic areas). In addition, implementation of the River Protection Overlay would allow for the removal of the Cascades Diversion Dam. If such construction or removal activities were to occur, then cultural landscape resources could be adversely affected by removing resources or by adding incompatible facilities within or adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse

impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts prove impossible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

El Portal. The management zoning designations for the river corridor in El Portal could allow for construction of facilities (e.g., trails, parking areas, restrooms, park operational facilities, and picnic areas) and removal or relocation of facilities. If these actions were to occur, then cultural landscape resources could be adversely affected by removing historic structures or by adding incompatible facilities adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Wawona. The management zoning designations in the river corridor in Wawona could allow for construction of facilities (e.g., trails, parking areas, restrooms, and picnic areas) and removal or relocation of facilities. If these actions were to occur, then cultural landscape resources could be adversely affected by removing or altering historic fabric, removing historic structures, or by adding incompatible facilities within or adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that are affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Summary of Alternative 3 Impacts. The management zoning designations and River Protection Overlay could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning designations and the River Protection Overlay could allow for the development of new facilities, the relocation or removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the

undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Cumulative Impacts

Cumulative impacts to cultural landscape resources discussed herein are based on analysis of the effects of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect cultural landscape resources within the river corridor or in the park vicinity.

Past Actions. Cultural landscape resources have been lost or damaged in Yosemite through past development, visitor use, and natural events. In wilderness areas, cultural landscape resources include remnants of early stock grazing, trails, and work camps. In Yosemite Valley, Wawona and El Portal, cultural landscape resources include early hotels, bridges, stores, studios, cabins, farms, and railroad structures that were associated with early Euro-American pioneer settlement and industries. In the Merced River gorge, cultural landscape resources include segments of the early wagon road and engineering projects. Rapidly disappearing structures and sites in other areas include homestead cabins, barns, road and trail segments, bridges, mining complexes, railroad and logging facilities, blazes, and campsites. These resources are reminders of the area's ranching, grazing, lumbering, and mining history.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects cultural landscape resources within the Merced River gorge. Cultural landscape resources are protected during construction by implementation of a compliance monitoring program.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could affect cultural landscape resources in the vicinity of the Merced River corridor include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Wawona Campground, Tamarack Campground, Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS)
- The *Yosemite Valley Plan* (NPS)
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Yosemite View parcel land exchange, El Portal (NPS)

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- The Update to the *Yosemite Wilderness Management Plan* (NPS)
- Several water improvement projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Merced River Canyon Trail Acquisition (BLM)
- Update to the *Yosemite Fire Management Plan* (NPS)

Given that each of these actions could result in removal of historic fabric or resources, add noncontributing elements to the historic cultural landscape, or add incompatible facilities within or adjacent to a cultural landscape resource, these cumulative projects would have a long-term, adverse impact on cultural landscape resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

The preferred alternative of the *Yosemite Valley Plan* includes actions in Yosemite Valley that could affect cultural landscape resources. However, it is acknowledged that some of these actions in Yosemite Valley are not compatible with the management zones of Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

Conclusion

The management zoning designations and River Protection Overlay could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning designations and the River Protection Overlay could allow for the development of new facilities, the relocation or the removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

National Historic Preservation Act Section 106 Summary

Under regulations of the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800.9) that address the criteria of effect and adverse effect, the zoning designations and River Overlay Protection proposed under this alternative would allow (but do not prescribe) actions that have the potential to adversely affect significant properties. The National Park Service has determined that selection of this alternative would result in “no effect” to historic properties listed in or eligible for listing in the National Register of Historic Places. The California State Historic Preservation Officer has concurred with this determination.

Visitor Experience

Analysis

General Impacts. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, resources that affect visitor experience that are not related to the Merced River (e.g., rock climbing) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan and Resources Management Plan*), as well as by federal law (e.g., the National Park Service Organic Act). Visitor experience Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) include activities such as river-related camping, hiking, picnicking, and opportunities for solitude and enjoyment of natural river sounds and the scenery of riverine habitats, such as riparian forests, meadows, and the aquatic environment.

The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*. Alternative 3 management zoning, in combination with the implementation of Visitor Experience and Resource Protection (VERP) proposed under this alternative (refer to discussions of specific areas below), would provide increased protection for these Outstandingly Remarkable Values compared to the absence of zoning in the No Action Alternative.

Implementation of the VERP framework would have an overall beneficial impact on all recreation Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is designed to protect and enhance the quality of the visitor experience. Over the long term, implementation of VERP could have a beneficial impact on visitor experience because it would protect the visitor experience from adverse impacts associated with visitor use.

For example, if the number of encounters along a segment of trail were selected as an indicator of desired visitor experience, violation of the standard associated with this indicator would result in management action to manage or limit visitor use in the area. The management action could be to redirect some visitors to trails where the standard is not being violated, or to reduce the frequency of shuttle bus stops at the trailhead. This action would have a beneficial impact by discontinuing further visual and ecological degradation of the trail segment and thus protecting the future enjoyment of the trail.

Implementation of the VERP framework would manage visitor use in the Merced River corridor in Yosemite National Park. Because the management actions necessary to protect visitor experience and natural resources are unknown, and it is uncertain how protecting the visitor experience and resources would specifically affect accessibility to the Merced River corridor, analysis of the impacts of implementation of VERP on overall Yosemite visitation, and thus the accessibility to recreational opportunities, the wilderness, interpretation and orientation facilities, or visitor services would be speculative. Before new management action were taken, a determination would be made as to whether preparation of environmental documentation to comply with the provisions of the National Environmental Policy Act or other applicable legislation would be required to assess the effects of the action on the environment – including recreation opportunities.

Recreation

Analysis

The following discussion provides an overview of the types of impacts to recreation resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter the recreational experience or use patterns of these areas compared to the No Action Alternative. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Consequently, the application of management zoning within the wilderness segments would have no effect on the recreation experience within the wilderness.

Outstandingly Remarkable Values within wilderness segments include opportunities for solitude along the river with primitive and unconfined river-related recreation (e.g., day hiking,

backpacking, fishing, horseback riding and packing, camping, and enjoyment of natural river sounds). Effects to recreation-related Outstandingly Remarkable Values within wilderness portions of the Merced River are considered beneficial under this alternative, because the proposed zoning would protect the quality of recreational opportunities while precluding new development that could reduce this quality or its availability.

Impacts in Yosemite Valley. Recreation Outstandingly Remarkable Values of Yosemite Valley include opportunities to experience a spectrum of river-related recreational activities, from nature study and sightseeing to hiking. Yosemite Valley is one of the premier outdoor recreation areas in the world. While implementation of VERP under this alternative would protect and enhance these Outstandingly Remarkable Values, the application of proposed management zoning has the potential to limit the spectrum of river-related recreation within Yosemite Valley. Recreational zoning protects the diversity of recreational experiences along the length of Yosemite Valley – from opportunities for solitude, group activities, challenge, and access. This protected access to diverse experiences would result in a long-term, minor, beneficial impact.

Alternative 3 zoning prescriptions (e.g., the 2A zoning over most of the west Valley and 2B in the east Valley) could shift the emphasis in many areas within the Merced River corridor, from use by a large number of visitors to use by a smaller number of individuals. At the same time, zoning would also shift emphasis from socially oriented recreational activities, characterized by spontaneity and group activities, to more individually oriented activities characterized by solitude and quiet. Overall, management zoning (e.g., the 2A and 2B zones in addition to the River Protection Overlay) would focus on minimizing impacts to and restoring sensitive areas within the river corridor. As a result, the current access to and availability and diversity of recreational opportunities in the corridor could be decreased. The recreational opportunities that could be most directly affected involve non-motorized watercraft (e.g., rafts, inner tubes, kayaks) and camping. Other opportunities that could be more indirectly affected include hiking, fishing, sightseeing, photography, nature study, bicycling, and stock use. The trail system would remain unaffected by zoning but could require adjustment over time as a result of VERP monitoring.

Under Alternative 3, management zoning prescriptions could reduce potential development of launch and removal sites for non-motorized watercraft (e.g., rafting) in the corridor. Rafting would be consistent with the 2B zone (between Stoneman Bridge and Sentinel Beach), but could occur with less intensity in this zone. The restriction of developed launch and removal sites for rafting, and use of other non-motorized watercraft, would result in a local, long-term, minor, adverse impact on the visitor experience.

Bicycling would be restricted mostly to roads and multi-use paved trails outside the corridor under Alternative 3. This would not affect bicyclists in the west Valley, as there are no paved bicycle trails in this area of the corridor, and visitors are limited to bicycling on existing roads; this zoning would, however, preclude the construction of future multi-use paved trails in the corridor. Bicyclists could still access trails in the east Valley or use the existing road system. Therefore, there would not be an impact on visitor experience.

The ability of the visitor to engage in activities such as picnicking at formal facilities in the corridor could be decreased in Yosemite Valley due to management zone prescriptions (e.g., the

2A zone). This activity would be most likely to occur in the corridor at Sentinel Beach (zone 2C) and Cathedral Beach (zone 2C). Access to the corridor downstream of Sentinel Beach (zone 2A) could, for the most part, be limited to less-intensive recreational use. Though this change could create a relatively quiet zone characterized by more casual use, a local, long-term, minor, adverse impact could occur, as visitors would be displaced from areas formerly used for higher-intensity recreation. Visitors who access these areas, however, would find more natural quiet and less crowding, thus likely altering the characteristics of the experience from existing conditions.

The effects of Alternative 3 zoning on camping or lodging in Yosemite Valley are analyzed in this section under the heading “Visitor Services.”

Impacts in the Merced River Gorge and El Portal. In the Merced River gorge, recreational access and availability could change through the possible elimination of the Cascades picnicking and day-use area.

In El Portal, river-based recreational opportunities could be increased due to management zoning in the vicinity of the Trailer Village, which could eventually be managed as a natural discovery area (zone 2B). This would result in a long-term, negligible, beneficial impact on recreational opportunities in El Portal. Access to the river for fishing, swimming, and kayaking near the sand pit and Patty’s Hole would not be altered under this alternative.

Outstandingly Remarkable Values within the gorge and El Portal include a range of river-related recreational opportunities, in particular white-water rafting and kayaking (class III to V), fishing, picnicking, photography, and sightseeing. Effects to recreation-related Outstandingly Remarkable Values within these segments of the Merced River are considered beneficial under this alternative, because the proposed zoning would protect the range of recreational opportunities while precluding new development that could reduce this range of opportunities or its availability.

Impacts in Wawona. Management zoning could result in the removal of formal picnicking facilities from current locations within the corridor, near the Wawona grocery store and Wawona Campground. This result could limit the diversity of recreation in the area and thus have a slight negative effect on some activities; this effect, however, would be accompanied by a beneficial effect of reduced crowding, improving the value of the river corridor for informal picnicking and other similar activities. Other recreational uses in the Wawona area would not change under this alternative.

The effects of Alternative 3 zoning on camping in Wawona are analyzed in this section under the heading “Visitor Services.”

Outstandingly Remarkable Values within Wawona include opportunities to experience a spectrum of river-related recreational activities, from nature study and photography to hiking. Effects on recreation-related Outstandingly Remarkable Values within Wawona of the South Fork of the Merced River would also be considered long-term, minor, and beneficial under Alternative 3, because the proposed zoning would protect the range of recreational opportunities while precluding new development that could reduce this range of opportunities or its availability, although this beneficial effect would be somewhat offset by a decrease in the diversity of recreational opportunities in the corridor, such as picnicking at formal facilities.

Summary of Alternative 3 Impacts. Alternative 3 could have either a beneficial or adverse impact on visitor experience as it relates to access to and availability of recreational opportunities, because of changes in the character and accessibility of recreational opportunities in the river corridor. The implementation of potential future actions in accordance with the management zones of Alternative 3 is considered to be either a long-term, minor, beneficial impact or adverse impact, depending on the viewpoint of the recreational user. The quality of the recreational experience could improve because of improved quality of the environment, and because the proposed zoning would protect the range of recreational opportunities while precluding new development that could reduce this range or its availability. However, the availability and access to certain areas and activities could be restricted (particularly in Yosemite Valley), which would be a local, long-term, minor, adverse impact.

Cumulative Impacts

Cumulative impacts on visitor experience as it relates to recreation are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified include only those that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions would have a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities (e.g., restrooms) that mitigate adverse effects associated with visitor use.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on visitor experience. Short-term, construction-related effects include travel delay and closure of the area to recreational use. Those effects are mitigated by implementation of a traffic control plan with measures such as strict construction timing restrictions, roadway safety procedures, and the use of flaggers, and signals. Long-term effects are improved access to recreational opportunities along the river corridor and El Portal Road, and easier, more dependable, and safer access for recreational vehicles, buses, and other vehicles to Yosemite Valley and other park destinations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both adverse and beneficial effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to recreation include:

- The Yosemite Area Regional Transportation System (YARTS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River Canyon Trail Acquisition (BLM)

These projects would provide increased access for visitors to the park and expand recreational opportunities in the vicinity of the park.

Reasonably foreseeable projects that could have both adverse and beneficial impacts include:

- *The Yosemite Valley Plan*
- The update to the *Yosemite Wilderness Management Plan* (NPS)

These projects have the potential to enhance the quality of the visitor experience in the wilderness and Yosemite Valley but also could result in the removal of existing recreational facilities. For example, the *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could be considered a local, long-term, adverse impact to some users, due to the loss of a unique lodging experience in the wilderness. This action could also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness, a reduction in stock impacts, improvements in scenic and natural quiet, and improvements in opportunities for solitude and a primitive and unconfined recreational experience.

Reasonably foreseeable projects that could have a net adverse effect on visitor experience include:

- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); Hazel Green Ranch (Mariposa Co.); and the Yosemite West Rezoning Application (NPS)

These projects could increase visitor use in the park and in the river corridor and could contribute to increased congestion and reduce the quality of specific, solitude-based recreational opportunities in the park.

The cumulative projects would have a long-term, negligible, beneficial impact, because the beneficial impacts associated with increased visitor access and expanded recreational opportunities would be partially offset by the adverse impacts associated with the removal of specific recreational opportunities.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, beneficial impact on recreation, because an increase in visitor access, an expansion of recreational opportunities, and improved quality of the natural environment would only be partially offset by the possible reduction in the availability of certain activities and access to certain areas.

Conclusions

Alternative 3 could have either a beneficial or adverse impact on visitor experience as it relates to access to and availability of recreational opportunities, because of changes in the character and accessibility of recreational opportunities in the river corridor. The implementation of potential future actions in accordance with the management zones of Alternative 3 is considered to be either a long-term, minor, beneficial impact or adverse impact, depending on the viewpoint of the recreational user. The quality of the recreational experience could improve because of improved quality of the environment, and because the proposed zoning would protect the range of recreational opportunities while precluding new development that could reduce this range or its availability. However, the availability and access to certain areas and activities could be restricted (particularly in Yosemite Valley), which would be a local, long-term, minor, adverse impact.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, beneficial impact on recreation, because an increase in visitor access, an expansion of recreational opportunities, and improved quality of the natural environment would only be partially offset by the possible reduction in the availability of certain activities and access to certain areas.

Interpretation & Orientation

Analysis

The following discussion provides an overview of the types of impacts to interpretation and orientation that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter interpretation or orientation of these areas compared to the No Action Alternative. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue as currently managed. There would be no impact compared to the No Action Alternative.

Impacts in Yosemite Valley. In general, management zoning prescriptions under Alternative 3 could restrict where and how interpretation and orientation programs are conducted. Under this alternative, the emphasis would be on self-guided interpretive trails and ranger-led walks and talks for small groups. For example, management zoning prescriptions would allow for only self-guiding interpretation between Sentinel Beach and Bridalveil Fall (zone 2A). Ranger-led group

walks and talks would be limited in frequency and size in most areas of Yosemite Valley. Marked trails and exhibits, and a full variety of interpretive programs would be allowed within the corridor at only a few areas, such as Cathedral Beach (2C), Sentinel Beach (2C), and Happy Isles (2D). Interpretive programs currently offered by park partners, such as school programs by the Yosemite Institute and tram tours by the concessioner, would be restricted in a manner similar to ranger-guided programs. This would result in a local, long-term, minor, adverse impact on visitor experience, because large groups could be discouraged from accessing programs in much of the corridor.

Amphitheater programs could continue at the Lower Pines Campground.

Impacts in the Merced River Gorge and El Portal. There are no interpretive programs currently offered in the gorge or in El Portal. Under Alternative 3, this condition would not change (compared to Alternative 1). Management zoning under Alternative 3 would not affect existing interpretive signs and exhibits.

Impacts in Wawona. Amphitheater programs could continue at Wawona Campground. Elsewhere in the corridor, zoning would have adverse effects. Interpretive living-history programs in the Pioneer Yosemite History Center in Wawona would be inconsistent with zoning prescriptions and could be discontinued in the river corridor. Application of management zoning could also limit the types of interpretive programs offered as well as the ability to construct trails and erect signs and exhibits in Wawona. Other interpretive programs in Wawona would likely remain unchanged. Overall, Alternative 3 would have a long-term, minor, adverse impact on interpretation and orientation due to the possible loss of these services at the Pioneer Yosemite History Center, and limits on signs and exhibits in Wawona.

Summary of Alternative 3 Impacts. Under Alternative 3, the ability of the National Park Service and its partners to continue offering the full range of interpretation programs for visitors could be restricted, and some programs could be eliminated. In addition, programs could focus on individuals and small groups, rather than larger groups, in most of the corridor. However, a full range of orientation and information services would continue to be available for visitors parkwide. Therefore, Alternative 3 could have a local, long-term, minor, adverse impact on visitor experience as it relates to access to and availability of interpretation and orientation programs and services.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to interpretation and orientation are based on analysis of past and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect visitor interpretation and orientation within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under the jurisdiction of these agencies. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and

calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to orientation and interpretation include:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)

These projects could enhance the quality of the visitor experience by expanding interpretation and orientation services in Yosemite Valley and Wawona.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

This planning effort could prescribe the closure of the Merced Lake High Sierra Camp. The potential discontinuation of visitor use of the Merced Lake High Sierra Camp would disrupt the High Sierra Camp loop-trip experience and the ranger-led interpretive hikes in the wilderness. On the other hand, this could result in a beneficial effect for other user groups who would benefit from a reduction in facilities in the wilderness and enhanced opportunities for solitude and self-guided interpretive experiences.

The cumulative projects would have a long-term, minor, beneficial, impact because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by the potential loss of ranger-led hikes in the wilderness.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, adverse impact on interpretation and orientation, because programs and services would be more limited and directed to particular areas pursuant to Alternative 3, although this adverse impact would be partially offset by the beneficial impacts associated with an increase in interpretation and orientation programs and services associated with the cumulative projects.

Conclusions

Under Alternative 3, the ability of the National Park Service and its partners to continue offering the full range of interpretation programs for visitors could be restricted, and some programs could be eliminated. In addition, programs could focus on individuals and small groups rather than larger groups in most of the corridor. However, a full range of orientation and information services would continue to be available for visitors parkwide. Therefore, Alternative 3 could have

a local, long-term, minor, adverse impact on visitor experience as it relates to access to and availability of interpretation and orientation programs and services.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, negligible, adverse impact on interpretation and orientation, because programs and services would be more limited and directed to particular areas pursuant to Alternative 3, although this adverse impact would be partially offset by the beneficial impacts associated with an increase in interpretation and orientation programs and services associated with the cumulative projects.

Visitor Services

Analysis

The following discussion provides an overview of the types of impacts to visitor services that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter visitor services within these areas compared to the No Action Alternative. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue.

Impacts in Yosemite Valley. Management zoning prescriptions under Alternative 3 could result in an overall reduction in the availability and diversity of camping and lodging opportunities throughout the Merced River corridor. Certain facilities would be inconsistent with the management zoning prescriptions and could be removed.

In Yosemite Valley, management zoning (zone 2B) could result in the removal of the North Pines Campground, along with a portion of the Lower Pines Campground. The number of lodging units could also decrease. Four buildings at Yosemite Lodge and most of Housekeeping Camp could be eliminated due to their inconsistency with management zoning and the River Protection Overlay.

As with Alternative 1, the park would not be able to meet visitor demand for overnight accommodations, unless additional campsites and lodging units were constructed outside the corridor. There is currently a shortage of camping and lodging opportunities relative to visitor demand during the summer months, particularly for campsites in the Valley. During these peak months, Camp 4 (Sunnyside Campground), North Pines Campground, and Upper and Lower Pines Campgrounds are typically full.

In Yosemite Valley, Housekeeping Camp is typically full during the peak summer months, as is Yosemite Lodge year-round.

Alternative 3 could displace some visitors from the park, forcing them to plan ahead to secure overnight accommodations during peak times, to stay outside the park, or to visit at a different season (or not at all). Visitation during other times of the year might increase as a result.

The effects of decreased camping and lodging opportunities could constitute a local, long-term, moderate, adverse impact on visitor experience because of reduced opportunities for overnight accommodation and because some visitors would be displaced from the park. If corridor campsites and lodging units were replaced outside the corridor, the impact would be reduced and would be negligible.

The National Park Service, park partners, and the primary park concessioner would continue to operate most existing food service and retail outlets in Yosemite Valley, and thus would continue to meet demand. Therefore, there would be no beneficial or adverse impact associated with these aspects of visitor services.

Impacts in the Merced River Gorge and El Portal. There are no visitor services currently offered in the gorge. Visitor services available in El Portal are largely run by private businesses (e.g., lodging, restaurants, etc.) and would not be affected by Alternative 3.

Impacts in Wawona. During peak summer months, Wawona Campground and the Wawona Hotel are typically full. Approximately one-third of the campsites at Wawona Campground would be located within the River Protection Overlay and could be relocated or removed. This would further exacerbate the park's ability to meet demand in Wawona, especially during peak summer months. Additional campsites could be built outside the corridor. Should the campsites located within the River Protection Overlay be removed and not replaced elsewhere, this would result in a long-term, minor, adverse effect on visitor services due to the reduction of campsites in the park.

Summary of Alternative 3 Impacts. Alternative 3 could have a local, long-term, moderate, adverse impact on visitor services. The impact is moderate because the inability to meet visitor demand for overnight accommodations could worsen, several camping opportunities could be eliminated, and, in general, some visitors seeking overnight camping or lodging opportunities could be displaced from the corridor.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. Upper and Lower River Campgrounds and part of Lower Pines Campground were closed following damage sustained during the 1997 flood. This resulted in a decrease in the

overall number of campsites available to visitors in the Valley. Similarly, lodging units at the Yosemite Lodge were removed as a result of flood damage and have not been replaced.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Examples of projects that could have a cumulative, beneficial effect on visitor services include:

- The Yosemite Area Regional Transportation System (YARTS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Garrotte Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); and the Yosemite West Rezoning Application (NPS)

These projects could improve transportation to and from the park, which would ultimately have a beneficial effect on visitor services by providing increased access for visitors staying outside the park. In addition, the number of campsites and lodging units in the park and in the park vicinity could increase, which would improve visitor services for park visitors.

Reasonably foreseeable projects that could have a net adverse effect on visitor services include:

- The update to the *Yosemite Wilderness Management Plan*

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. This change could affect the ability to meet the lodging demand in the corridor and park and could be considered an adverse impact, due to the loss of a unique lodging experience in the wilderness.

Examples of projects that could have a cumulative mixed effect on visitor services include:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* proposes restoration of degraded areas and a reduction of development within the Merced River ecosystem while enhancing the quality of the visitor experience in Yosemite Valley. Visitor services could be improved by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The *Yosemite Valley Plan*, however, would prescribe a reduction in camping and lodging units in Yosemite Valley (although Yosemite Lodge would be expanded), which would have an adverse effect on the provision of visitor services. However, it is acknowledged that some of the components of the *Yosemite Valley Plan* (for example, the expansion of a portion of Yosemite Lodge and the development of Camp 6) would not be compatible with the management zoning in Alternative 3. The *Merced*

River Plan guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* would likely have a local, long-term, adverse impact on visitor services due to a likely reduction in the number of overnight accommodations in the Valley.

These cumulative projects would have a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, moderate, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Conclusions

Alternative 3 could have a local, long-term, moderate, adverse impact on visitor services. The impact is moderate because the inability to meet visitor demand for overnight accommodations could worsen, several camping opportunities could be eliminated, and, in general, some visitors seeking overnight camping or lodging opportunities could be displaced from the corridor.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, moderate, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Wilderness Experience

Analysis

The following discussion provides an overview of the types of impacts to the wilderness experience that could occur within the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Under Alternative 3, management zone prescriptions applied to wilderness areas within the Merced River corridor reflect existing conditions. The wilderness zones include trailed areas with

heavy use, trailed areas with light use, and untrailed areas. Most visitors experience the wilderness area by foot, though there is a small percentage of stock use. Heavy Use Trails (zone 1C), particularly en route to the wilderness via Little Yosemite Valley, provide the least opportunity for solitude, as encounters with other visitors are likely to be frequent. In the Trailed Travel zones (1B), visitor encounters would be infrequent, except at key trail junctions and camping areas (e.g., near Merced Lake High Sierra Camp). In the Untrailed zones (1A), there would be a very high potential for solitude and primitive camping experiences due to the remoteness of the area.

Management zoning prescriptions under this alternative would not change access to the wilderness or access to backpackers campgrounds in the wilderness.

Overall, access to the wilderness within the Merced River corridor would continue to be managed under the current wilderness permit system, and primitive camping and opportunities for solitude would remain available. At present, the park is able to accommodate visitor requests for wilderness permits parkwide, although demand specifically for access to the upper reaches of the Merced River corridor (particularly in Little Yosemite Valley) exceeds the availability of wilderness permits as controlled by the quota system. This condition would likely continue under Alternative 3 in order to maintain the management direction that visitors have the ability to experience solitude and engage in a primitive camping experience in the wilderness.

Summary of Alternative 3 Impacts. The wilderness experience under Alternative 3 would be the same as that for Alternative 1. Therefore, this is considered to have no impact under Alternative 3.

Cumulative Impacts

Cumulative effects on the wilderness experience are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect the wilderness experience within the river corridor or in the park vicinity.

Past Actions. The wilderness permit/trailhead quota system, established in 1974-1976 set limits for the numbers of people allowed to enter the wilderness per day per trailhead. These limits were based on extensive research and monitoring to assess capacity based on ecological and social considerations, and were in response to exceptionally high levels of use in the early- to mid-1970s. This system has had beneficial impacts on the wilderness experience through implementation of a quota system to protect natural resources.

Present Actions. The wilderness permit/trailhead quota system continues to limit and/or disperse use based on trailhead access, and thus provides the beneficial impact of improved experience of natural values due to resource protection.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to wilderness experience include:

- Several planning or restoration efforts are in various stages of development, including the *Fire Management Plan* (NPS); the *Fire Management Action Plan for Wilderness* (USFS); the Sierra Nevada Framework for Conservation and Collaboration (USFS); Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); the Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus); the Tuolumne Meadows Development Concept Plan (NPS); and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Merced Canyon River Trail Acquisition (BLM)

These projects could result in the restoration of wilderness areas within the park and in the park vicinity. Any improvement to the wilderness ecosystem is considered to be a long-term, beneficial impact.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could affect the ability to meet lodging demand and would impact some users due to the loss of a unique lodging experience in the wilderness. In addition, the potential discontinuation of visitor use of the High Sierra Camps would eliminate the High Sierra Camp loop-trip experience. On the other hand, this action might also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness and reduction in stock impacts. These individuals could benefit from improvements in scenic and natural quiet qualities, opportunities for solitude, and an overall primitive recreational experience.

These cumulative projects would have a long-term, minor, beneficial impact on the wilderness experience, because the wilderness ecosystem would be improved and would only be partially offset by the long-term, adverse impact of removing the High Sierra Camps.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Conclusions

The wilderness experience under Alternative 3 would be the same as that for Alternative 1. Therefore, this is considered to have no impact under Alternative 3.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Social Resources

Land Use

Analysis

General Impacts. Under the management zones for Alternative 3, expansion and/or development of uses and facilities within the river corridor could occur, altering the intensity of the use of a specific site. However, the basic land use designation of Yosemite National Park (i.e., public parklands) would not change under Alternative 3, and National Park Service policy concerning the acquisition of private lands within or adjacent to the park is compatible with current plans and policies and would not change under Alternative 3; therefore, there would be no land-use impacts on parklands or other properties within or adjacent to the park.

Private property within the river corridor in El Portal and Wawona is not zoned under the *Merced River Plan*. Management zones in the *Merced River Plan* would not result in conflicts with existing land uses or existing plans and policies and would not induce changes in those land uses.

Section 8 of the Wild and Scenic Rivers Act withdraws lands within the boundaries of Wild and Scenic Rivers from “public entry, sale, or disposition under the public land laws of the United States.” This section of the Wild and Scenic Rivers Act preempts public land laws, such as the 1872 General Mining Act, under which nonreserved public lands may be disposed of for private use. However, because Yosemite National Park is by definition “reserved land,” no additional lands have been identified for withdrawal under the *Merced River Plan*. Furthermore, much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772).

In accordance with Section 9 of the Wild and Scenic Rivers Act, lands within one-quarter mile of the main stem and South Fork of the Merced River have been withdrawn from all forms of appropriation under mining and mineral leasing laws of the United States. Because much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772), no additional lands have been identified for withdrawal under the *Merced River Plan*.

Summary of Alternative 3 Impacts. Under Alternative 3, the adoption of management zoning is considered to be a short-term, minor, beneficial impact. Since the basic land use of the park would not change, no impacts to land uses would occur as a result of Alternative 3.

Cumulative Impacts

Cumulative impacts to land use discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect land use within the river corridor and in the immediate vicinity of Yosemite National Park.

Past Actions. In general, land uses in the Merced River corridor have been determined by past decisions on the development, relocation, and removal of specific facilities. Development within the Merced River corridor has occurred since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) does not affect the land uses within the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that are anticipated to change overall land uses can be separated into local and regional projects. Local projects (i.e., those within the park and involving parklands) being carried out under the direction of the National Park Service include:

- The *Yosemite Valley Plan*, the Yosemite View parcel land exchange, El Portal; South Entrance/Mariposa Grove Site Planning; Resources Management Building; Yosemite West Rezoning Application; Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan; Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and Crane Flat Campus Redevelopment (NPS, YNI)
- Several Yosemite campground rehabilitation projects include Tamarack Campground, Bridalveil Horse Camp, Yosemite Creek Campground, Hodgdon Meadow Campground, and the Wawona Campground Improvement (NPS)

Local projects have the potential to change land uses within the park. For example, the *Yosemite Valley Plan* could change existing land uses and the intensity of existing land uses within portions of the Merced River corridor in Yosemite Valley as well as in El Portal and Wawona. These changes to land uses would be dictated by the development plans outlined in the *Yosemite Valley Plan*. The preferred alternative of the *Yosemite Valley Plan* proposes development and/or redevelopment of portions of Upper Pines Campground, Curry Village, and Yosemite Lodge. However, it is acknowledged that this development and/or redevelopment is not compatible with the management zones of Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Since components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the cumulative impacts of the *Yosemite Valley Plan* are unknown.

Another example of a local project is the land exchange between the National Park Service and the owner of a parcel of private property near the park's western entrance at the El Portal Administrative Site. The owner of the private parcel would receive a plot of National Park Service land adjacent to the owner's hotel properties in exchange for the landowner's plot two miles west of the Arch Rock Entrance Station. This land exchange would allow the National Park Service to construct facilities, such as a vehicle turnaround area, that would increase the vehicle handling efficiency of the entrance station. The U.S. Congress has passed legislation allowing this land exchange to occur, but it is not yet completed. Though completion of the land exchange would alter the land use for those two plots of land, the overall effect would be negligible, because the two plots of land are close together and there would be no net change in the amount of each type of land use in the area. A similar land exchange would also take place in Wawona. The Seventh Day Adventist recreational camp is located in Wawona on privately owned land inside the boundaries of Yosemite National Park. The privately owned land occupied by the camp literally abuts portions of Yosemite's designated Wilderness. To protect designated Wilderness this project would exchange lands between the National Park Service and the Seventh Day Adventist camp.

Regional projects (those that take place outside of the park) that would affect land use and planning within the Yosemite region and are not under National Park Service jurisdiction include:

- Projects undertaken by county governments include: Hazel Green Ranch (Mariposa Co.); Mariposa County General Plan Update (Mariposa Co.); Yosemite Motels, El Portal (Mariposa Co.); Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); Buildout of the City of Merced, General Plan (City of Merced); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); and Evergreen Road Improvements (multi-agency, see Appendix G)
- Projects undertaken by federal agencies include: South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM); Sierra Nevada Framework for Conservation and Collaboration (USFS); and Merced River Canyon Trail Acquisition (BLM)

Regional projects have the ability to alter land use in the park vicinity. An example of such a project would be the Mariposa County General Plan Update, which is scheduled to begin in 2000. Although the plan does not explicitly call for land use changes, it does provide general guidance for land use, zoning, and development throughout Mariposa County, which could likely impact land use in the long term.

Another regional project that could affect land use is the *South Fork and Merced Wild and Scenic River Implementation Plan*. This plan covers management of lands along river segments including: a 15-mile portion of the main stem extending from the El Portal Administrative Site to a point 300 feet upstream of the confluence with Bear Creek; a 21-mile segment of the South Fork from the park boundary to the confluence of the Merced River; and a 3-mile segment of the South Fork just upstream of Wawona, where the National Park Service has jurisdiction over the north side of the river and the U.S. Forest Service has jurisdiction over the south side. The plan calls for the long-term protection of natural and cultural resources, and managing the area for the

use and enjoyment of visitors in a way that will leave the resource unimpaired for future use and enjoyment as a natural setting.

The impact intensity of planning projects would depend upon the extent to which the plan's recommendations were implemented. Land uses would most likely shift in various areas. The short-term impacts on land use would be neither adverse nor beneficial; likewise, long-term impacts on land use would be neither an adverse nor beneficial.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Conclusions

Since the basic land use designation would not change, no impacts to land uses would occur as a result of Alternative 3.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Transportation

Analysis

General Impacts. The following discussion provides an overview of the types of transportation impacts that could occur within the Merced River corridor from application of Alternative 3.

Under Alternative 3, the 2B zone could allow for the removal of overnight accommodation facilities in the park (campsites or lodging) from within the Merced River corridor. If those facilities were relocated to locations elsewhere in the park, then the current mix of park overnights and day visitors would be maintained, and there would be no change to traffic conditions from those described for Alternative 1. If, however, those facilities were removed from the river corridor and not relocated elsewhere in the park, then the number of park overnights would decrease, and more regional traffic (entering and leaving the park) and local traffic within the park would be generated, and more local traffic could be generated within Yosemite Valley. An overall reduction of overnight accommodation facilities in the park would cause visitors who otherwise (under Alternative 1) would stay overnight in the park to use campsites and/or lodging outside the park (i.e., to become day visitors, or more precisely, local overnights). That shift to higher numbers of local overnights would increase the amount of traffic entering and leaving the park, because visitors would need to make two trips per day between their out-of-park accommodations and attractions within the park. This would have a long-term, minor, adverse impact on traffic conditions at park entrances and on the majority of park roadways (i.e., outside of Yosemite Valley, including in Wawona and El Portal) by slightly increasing delays experienced by queues of backed-up vehicles, and slightly increasing congestion and delays experienced by drivers on roadways outside of the Valley.

Also as a result of the application of the management zoning, parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed and not relocated elsewhere, then more traffic congestion would be generated within the park, because visitors unable to find an authorized place to park would circle around, increasing traffic volumes at congested locations. This would have a long-term, minor, adverse impact on traffic conditions in Yosemite Valley by slightly increasing congestion and delays experienced by drivers. If parking spaces were relocated to areas outside the river corridor, the relocated spaces would reduce the above-described adverse effects of removing parking spaces within the river corridor. It also is assumed that the Restricted Access Plan would continue to be implemented during peak-season periods when criteria for implementation were met.

Additionally, if parking spaces were removed and not relocated elsewhere (as described above), then conflicts between vehicles would potentially increase, because visitors unable to find an authorized space could decide to park in unauthorized/improper areas. This would have a long-term, minor, adverse impact on traffic safety conditions by slightly increasing the potential for traffic safety hazards.

Under Alternative 3, the River Protection Overlay could allow for the removal of vehicle bridges over the Merced River, altering the circulation patterns of vehicles (private, regional public transit, Valley shuttle, etc.). This would have a long-term, moderate, adverse impact on traffic conditions in Yosemite Valley by moderately increasing traffic volumes on the remaining bridges (and roadways used to access those bridges).

Summary of Alternative 3 Impacts. The implementation of potential future actions in accordance with the management zoning and the River Protection Overlay of Alternative 3 is considered to be a long-term, moderate, adverse impact, because an increase in traffic congestion could result from the decrease in overnight accommodations and parking spaces within the river corridor, and from the removal of vehicle bridges over the Merced River.

Cumulative Impacts

Cumulative transportation effects discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect access and transportation in the vicinity of the river corridor.

Past Actions. Development of a circulation system that includes roadways, parking areas, and bridges has occurred within and in the vicinity of Yosemite National Park. This circulation system was developed to provide access to the park and the surrounding areas. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles until the traffic volume and parking demand in the Valley decreases sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on transportation. Short-term, construction-related effects include visitor delays and visitor hazards through the

construction work zone. Those effects are mitigated by implementation of a traffic control plan, with measures such as strict construction timing restrictions, roadway safety procedures, flaggers, and signalling. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which would be a long-term, beneficial impact.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have adverse effects.

Reasonably foreseeable projects that could have a cumulative, long-term, beneficial effect on regional transportation include the following:

- The Yosemite Area Regional Transportation System (YARTS)
- San Joaquin Corridor Rail Projects (DOT, Amtrak)
- The Yosemite West Rezoning Application (NPS)
- The *Yosemite Valley Plan* (NPS)

The aforementioned projects, individually and in combination, would reduce congestion by encouraging travel to the park by alternative (non-private vehicle) modes. For example, YARTS is a collaborative, multi-agency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion. The initial YARTS service would be a demonstration project (scheduled to begin by early summer 2000), with a target market of visitors staying overnight in the gateway communities and employees working at Yosemite National Park who live in the gateway communities. A successful YARTS would reduce the number of day visitors arriving in private vehicles. Similarly, the Yosemite West Rezoning Application would include a provision for a regional staging area to provide visitor parking and linkage to regional public transportation systems. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. However, it is acknowledged that this consolidated parking facility at Yosemite Village is not compatible with the management zones of Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, these projects would have a beneficial impact by reducing traffic congestion in Yosemite Valley.

Reasonably foreseeable projects that could have a short-term, adverse effect but a cumulative, long-term, beneficial effect on regional transportation include:

- Highway 41 Extension (Madera Co.)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.)
- Mariposa Creek Pedestrian/Bike Path (Mariposa Co.)
- Evergreen Road Improvements

Although the above projects would have site-specific and short-term, adverse effects (e.g., construction-related transportation effects), the general goal of these projects is to improve regional transportation circulation and safety.

Reasonably foreseeable projects that could have a short-term adverse effect on regional transportation include:

- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects and the A-Rock Reforestation (USFS, Stanislaus), and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); Crane Flat Campus Redevelopment (NPS, YNI); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and the Resources Management Building (NPS)

The adverse effects associated with the above projects would be short term in nature, primarily related to construction-generated traffic on roadways serving the project sites. These projects would not result in any net long-term effects to regional transportation.

Given the potential for a reduction in the number of day visitors arriving in private vehicles, these cumulative projects would have a long-term, minor to moderate, beneficial impact on the regional transportation system. The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented. The short-term construction-related traffic impacts that would occur from development of site-specific projects would not appreciably alter these long-term, beneficial impacts.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on traffic and traffic safety conditions in Yosemite National Park, because the moderate, adverse impacts associated with Alternative 3 would be partially offset by the long-term, minor to moderate, beneficial impacts associated with the cumulative projects.

Conclusions

The implementation of potential future actions in accordance with the management zoning and the River Protection Overlay of Alternative 3 is considered to be a long-term, moderate, adverse impact, because an increase in traffic congestion could result from the decrease in overnight accommodations and parking spaces within the river corridor, and from removal of vehicle bridges over the Merced River.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on traffic and traffic safety conditions in Yosemite National Park, because the moderate, adverse impacts associated with Alternative 3 would partially be offset by the long-term, minor to moderate, beneficial impacts associated with the cumulative projects.

Scenic Resources

Analysis

General Impacts. Scenic Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River or not unique to the region or nation have been removed (e.g., the confluence of tributaries in Wawona, magnificent views of Triple Divide Peak and the Sierra Crest within the wilderness segment of the South Fork). Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan* and *Resources Management Plan*), as well as by federal law (e.g., the 1916 Organic Act). Scenic Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) are now focussed on spectacular views from the river and its banks. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Implementation of the Visitor Experience and Resource Protection (VERP) framework would have a local, long-term, minor, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is intended to institutionalize an ongoing adaptive management program in which park staff would continuously monitor visitors and resources, identify discrepancies between existing and desired visitor experiences and resource conditions, and take action to achieve desired conditions. If monitoring determined that desired visitor experiences and resource conditions were not being met in a

particular management zone, management sub-zone, or segment, then management actions could be undertaken. An example of a management action that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leaved trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This would likely open previously closed views and improve the texture and lighting of the foreground of any landscape viewable from the Merced River corridor.

The following discussion provides an overview of the types of impacts to scenic resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., management zoning, the River Protection Overlay, the VERP framework).

Impacts in the Wilderness. Scenic Outstandingly Remarkable Values of the wilderness include views from the Merced River and its banks of the exposed bedrock riverbed, Merced Lake and Washburn Lake, the Bunnell Cascades, the confluence of tributaries, a large concentration of granite domes, and the Clark and Cathedral Ranges. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (as prescribed by zones 1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness reaches of the Merced River, these management elements would limit the type of new facilities (e.g., campsites with facilities are prohibited in the 1B zone) that could be built in the Merced River corridor. This would limit potential adverse effects on scenic resources associated with disruption of native vegetation or placement of facilities in undeveloped areas. The application of management zoning and the River Protection Overlay within wilderness segments would have a local, long-term, negligible, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in Yosemite Valley. The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, an important component of the scenic landscape within the Valley. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative.

- Several existing facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
- Developed launch and removal sites for non-motorized watercraft are minimal compared with Alternative 1 and could be reduced.
- Visitor access to the Merced River could be directed away from sensitive riparian areas zoned 2A and 2B to specific, more resilient locations such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C).
- Large areas of sensitive habitats, such as California black oak woodland and El Capitan Meadow, would be zoned 2A to receive increased protection over existing conditions.

Some overnight accommodations (Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed. Decreasing the total number of overnight accommodations in Yosemite Valley would likely have a local, long-term, minor, beneficial effect on scenic resources within the Merced River corridor, because of the removal of structures that currently intrude into the scenic landscape in some areas.

Visitor access characterized by moderate to high numbers of encounters with other park users in the Merced River corridor would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C). These 2C-zoned areas could be managed to minimize effects on natural areas within the corridor that are currently unprotected. The management zoning could have a local, long-term, moderate, adverse impact on visual resources at these locations, due to the potential for further degradation of natural vegetation caused by concentrated visitor access and use. However, concentrating visitor use at these locations in the Merced River corridor would allow for increased protection and restoration efforts in the 2A and 2B zones, which constitute the majority of the Merced River corridor in Yosemite Valley, resulting in a net long-term, moderate, beneficial effect on natural vegetation and scenic quality.

The scenic character of the entire river corridor (e.g., texture and lighting of the foreground of the landscape) could improve if the above actions were to occur and create opportunities for natural or directed revegetation. For example, the visual character of El Capitan Meadow is currently degraded by visitor use (trampling, soil compaction, and fragmentation). The current visitor-intensive use of El Capitan Meadow would be inconsistent with the 2A zoning, which is characterized by relatively undisturbed natural areas that receive only incidental or casual use. Application of the 2A management zoning and VERP could result in management actions that would redirect use away from sensitive areas such as El Capitan Meadow and initiate restoration of the meadow. These management actions would have a local, long-term, minor, beneficial impact on the scenic quality of the meadow.

Application of the River Protection Overlay could have both beneficial and adverse effects on scenic resources within Yosemite Valley. Adverse effects on scenic resources could occur if implementation of the River Protection Overlay resulted in the removal of a historic bridge. This could adversely affect scenic resources within the Merced River corridor due to the loss of an aesthetically pleasing component of the scenic landscape. Beneficial effects on scenic resources from implementation of the River Protection Overlay could include removal of facilities (e.g., portions of Housekeeping Camp) that intrude upon the natural character of the corridor, which would increase opportunities for natural revegetation and restoration of the river corridor. The net effect of the River Protection Overlay would be a local, long-term, minor beneficial impact on scenic resources, since the opportunities to increase natural vegetation and restoration of the river corridor would offset the adverse effects on scenic resources associated with possible removal of aesthetically pleasing historic bridges.

The intensity of potential impacts to scenic resources caused by Alternative 3 would be directly related to the effectiveness of methods employed in the park to reduce human-caused erosion within the river corridor and to reduce crowding at popular viewpoints. The VERP framework would monitor visitor use and its effects on scenic resources and scenic Outstandingly

Remarkable Values. Facilities such as boardwalks and fences could be used to route people away from sensitive natural resources, while still permitting access to important viewpoints. Signs could be used to promote an understanding among park visitors of how to avoid harm to natural communities and features, though any physical facilities constructed to manage the impact of people on scenic resources should be designed for minimal disturbance of and visual intrusion into the natural landscape.

Scenic Outstandingly Remarkable Values within Yosemite Valley include views from the Merced River and its banks of waterfalls and water features (Nevada, Vernal, Illilouette, Yosemite, Sentinel, Ribbon, and Bridalveil Falls, and Silver Strand), rock cliffs (Half Dome, North Dome/Washington Column, Glacier Point, Yosemite Point/Lost Arrow Spire, Sentinel Rock, Three Brothers, Cathedral Rocks, and El Capitan), and meadows (Stoneman, Ahwahnee, Cook's, Sentinel, Leidig, El Capitan, and Bridalveil). There is a scenic interface of river, rock, meadow, and forest throughout the segment. Alternative 3 would protect and enhance the scenic Outstandingly Remarkable Values through the application of extensive 2A and 2B management zoning in the Valley, the River Protection Overlay, and VERP. These management elements would place restrictions on new development and would encourage restoration activities. An example of a restoration activity that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leaved trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This would likely open views of scenic Outstandingly Remarkable Values from the Merced River corridor. Application of these management elements and implementation of VERP would have a local, long-term, moderate, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in the Merced River Gorge and El Portal. The majority of the Merced River gorge would have a quarter-mile boundary, be zoned 2A+, 2A, and 2B, and would receive increased protection over the absence of zoning under the No Action Alternative. Extensive use of 2A+, 2A, and 2B zoning in the gorge would substantially limit areas where new development could occur. Management zoning would ensure that the natural appearance of the gorge would be maintained, which would have a local, long-term, negligible, beneficial impact on scenic resources.

Scenic Outstandingly Remarkable Values of the Merced River gorge include views from the Merced River and its banks of the Cascades, spectacular rapids among giant boulders, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock. The extensive application of 2A+, 2A, and 2B zoning and the quarter-mile boundary over a majority of the Merced River gorge would protect and enhance these Outstandingly Remarkable Values. Management zoning in the gorge would substantially limit areas where new development could occur and would maintain the natural appearance of the gorge, ensuring the protection of the scenic Outstandingly Remarkable Values.

Some developed areas of El Portal would be zoned 3C (e.g., Railroad Flat, Old El Portal), which could allow additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site). Such development could have local, long-term, minor, adverse effects on the scenic character of the Merced River corridor in El Portal. Adverse

effects could be mitigated by implementing mitigation measures as described in Chapter II under Mitigation Measures Common to All Action Alternatives. The adverse impact on scenic resources in El Portal could be further offset by the potential restoration of disturbed or developed land to natural conditions such as at the Trailer Village (zone 2B) and the sand pit (zone 3C). This would have a local, long-term, minor, beneficial effect on scenic resources at these locations. Overall, scenic resources in El Portal would experience a local, long-term, negligible, beneficial effect from the potential restoration of disturbed or developed land to natural conditions. This beneficial impact would be partially offset due to the new development that could occur in El Portal under the 3C management zoning.

Impacts in the South Fork. The upper and lower portions of the South Fork would be zoned 1A, 1B, and 2A+. The majority of the South Fork through Wawona would be zoned 2B. The 1A, 1B, 2A+, and 2B management zoning would increase protection over the absence of zoning under the No Action Alternative. Application of these zones along the South Fork would substantially limit areas within the Merced River corridor where new development could occur. The 1A, 1B, 2A+, and 2B management zones would ensure that the natural appearance of these areas of the South Fork would be maintained, which would have a local, long-term, minor, beneficial impact on scenic resources.

Portions of some developments in Wawona would be inconsistent with the 2B management zoning (e.g., the Pioneer Yosemite History Center and the Wawona picnic area) and could be removed from the corridor. The Pioneer Yosemite History Center has aesthetically pleasing qualities, and the potential removal of this facility from the corridor would have an adverse effect on scenic resources. The Wawona picnic area is not a visually intrusive facility, but it does limit the potential for restoration in this area; if the picnic area were removed, scenic resources would be beneficially affected. Overall, potential removal of these facilities would have a local, long-term, negligible, adverse effect on scenic resources due to the loss of the aesthetically pleasing Pioneer Yosemite History Center, although this would be somewhat offset by the potential for restoration associated with removal of the Wawona picnic area.

Portions of features adjacent to the South Fork, such as Wawona Campground and the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated, thereby increasing opportunities for natural revegetation and restoration. Should these areas within the River Protection Overlay be restored, this would have a local, long-term, minor, beneficial impact on scenic resources in these areas.

Scenic Outstandingly Remarkable Values of the South Fork include views from the Merced River and its banks of large pothole pools within slick rock cascades, old growth forest, and meadows, Wawona Dome, and continual white-water cascades in the deep and narrow river canyon below Wawona. Alternative 3 would protect and enhance the scenic Outstandingly Remarkable Values through the application of 1A, 1B, 2A+, and 2B management zoning along the South Fork, the River Protection Overlay, and VERP. These management elements would place restrictions on new development and would encourage restoration activities. Should VERP monitoring reveal degradation of riparian vegetation due to visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the resource and management zone. Such management elements

would protect scenic Outstandingly Remarkable Values, including views from the river and its banks of unique features, and would have a local, long-term, minor, beneficial effect on scenic resources.

Summary of Alternative 3 Impacts. Generally, application of management zoning, the River Protection Overlay, and VERP would have a local, long-term, moderate, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley due to opportunities to restore degraded areas of the Merced River corridor, remove developments inconsistent with the River Protection Overlay, and to implement management actions to maintain desired resource conditions pursuant to VERP. In designated Wilderness, the impacts would be negligible and beneficial, because scenic resources in Wilderness areas would experience somewhat perceptible improvements compared to Alternative 1. In the gorge and El Portal, this alternative would have a negligible, beneficial impact on scenic resources by ensuring the natural appearance of the gorge would be maintained, and due to the potential for restoration in El Portal. In Wawona, impacts to scenic resources would be minor and beneficial.

Cumulative Impacts

Cumulative impacts to scenic resources discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect scenic resources within the river corridor or in the immediate park vicinity.

Past Actions. Scenic resources have been affected by numerous past actions since the inception of the park. Primary among these, when considered in relation to the potential effects of the *Merced River Plan*, is the alteration of natural communities caused by Euro-American settlers who lived in the park. For example, attempts to establish agricultural activities and the development of tourism resulted in the drying out of the Valley by breaching the moraine and controlling naturally occurring fire, which affected vegetation patterns along the Merced River. Broad-leaved trees along the river banks were replaced by the comparatively dense stands of conifers that exist today. This has had a local, long-term, adverse effect on scenic resources, as the conifers now block views of important scenic resources that were viewable before the vegetation patterns were changed.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor, and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net

beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Projects that could have a cumulative beneficial effect on scenic resources include those that could reduce the number of vehicles entering the park and therefore the frequency of intrusion of vehicles into the scenic landscape. Projects that improve the general health of ecosystems viewable from or within the Merced River corridor also would result in a net cumulative, beneficial effect on scenic resources. Examples of these types of projects are:

- The Yosemite Area Regional Transportation System (YARTS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams, Dinkey Lakes, and Monarch Wildernesses (USFS)

The general goal of these projects is to either reduce private vehicle traffic in the park, and especially in Yosemite Valley (which would reduce the frequency of vehicles intruding into important scenic resources viewable within or from the Merced River corridor), or to improve the health of ecosystems that make up parts of important scenic resources, either in the park or on lands adjacent to the park. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and restoring natural vegetation. These cumulative projects would have a net long-term, beneficial impact on scenic resources.

Reasonably foreseeable projects that could have an adverse effect on scenic resources include:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Yosemite View parcel land exchange, El Portal (NPS)

The local, long-term, adverse effects of these reasonably foreseeable projects would be related to the potential introduction of new structures and/or infrastructure that would intrude into views of important scenic resources within or viewable from the Merced River corridor. For example, the Yosemite View parcel land exchange could result in new development in an area of El Portal that is currently undeveloped and a reduction in the vegetative screening of the existing motel complex. This project would result in increased views of developed structures on the banks of the Merced River from Highway 140.

Reasonably foreseeable projects that could have a mixed effect on scenic resources include:

- The *Yosemite Valley Plan* (NPS)
- Wawona Campground Improvement (NPS)

The *Yosemite Valley Plan* would restore disturbed or developed land to natural conditions in the Valley and would develop new areas of the Valley (predominantly in the east Valley), Wawona, and El Portal. However, it is acknowledged that some of the components of the *Yosemite Valley Plan* (for example, the redevelopment of El Portal Trailer Village) would not be compatible with the management zoning in Alternative 3. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and markedly reducing traffic congestion. The *Yosemite Valley Plan* would likely have beneficial impacts on scenic resources in the Valley due to planned actions associated with large-scale restoration. The *Yosemite Valley Plan* would also likely have adverse impacts on scenic resources in El Portal and Wawona due to planned developments outside the Merced River corridor.

The Wawona Campground Improvement project would have a local, long-term, beneficial impact on scenic resources due to restoration activities to improve the existing degraded campground, including activities to revegetate the riverbanks. Some aspects of the campground improvement project could have adverse effects on scenic resources due to new development in undeveloped areas, such as the proposal to construct an additional campground in Section 35.

These past and reasonably foreseeable future actions could have a net local, long-term, minor, beneficial cumulative effect on scenic resources because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, and reducing the number of vehicles traveling through the park. This beneficial impact would be partially offset by adverse impacts associated with past alterations of natural communities and by new developments, such as the Yosemite View parcel land exchange in El Portal.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, moderate, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning and the River Protection Overlay in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial because scenic resources in Wilderness areas would experience somewhat detectable improvements compared to Alternative 1. In El Portal, Alternative 3 and the cumulative projects would result in local, long-term, negligible, adverse impacts to scenic resources due to visual intrusions in the scenic landscape from new developed facilities, such as the Yosemite View parcel land exchange. In Wawona, impacts to scenic resources would be minor and beneficial, due to opportunities for restoration pursuant to the management elements of Alternative 3 and the reduction in built facilities pursuant to the bridges replacement project.

Conclusions

Generally, application of management zoning, the River Protection Overlay, and VERP would have a local, long-term, moderate, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley due to opportunities to restore degraded areas of the Merced River corridor, remove developments inconsistent with the River Protection Overlay, and to implement management actions to maintain desired resource conditions pursuant to VERP. In designated Wilderness, the impacts would be negligible and beneficial, because scenic resources in Wilderness areas would experience somewhat perceptible improvements compared to Alternative 1. In the gorge and El Portal, this alternative would have a negligible, beneficial impact on scenic resources by ensuring the natural appearance of the gorge would be maintained, and due to the potential for restoration in El Portal. In Wawona, impacts to scenic resources would be minor and beneficial.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, moderate, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning and the River Protection Overlay in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial, because scenic resources in Wilderness areas would experience somewhat detectable improvements compared to Alternative 1. In El Portal, Alternative 3 and the cumulative projects would result in local, long-term, negligible, adverse impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as the Yosemite View parcel land exchange. In Wawona, impacts to scenic resources would be minor and beneficial, due to opportunities for restoration pursuant to the management elements of Alternative 3 and the reduction in built facilities pursuant to the bridges replacement project.

Socioeconomics

Social Environment

Analysis

General Impacts. Under the application of management zones for Alternative 3, a number of employee residences could possibly be displaced in Yosemite Valley, Wawona, and El Portal. In Yosemite Valley, the Valley stable and park concession employee residences at the Valley stable would be inconsistent with the 2B zoning prescription and could be relocated from the corridor to another area of the Valley or could be removed from the park altogether. If the Valley stable were relocated elsewhere in the Valley, then the employee residences at the stable would likely be relocated to the El Portal Administrative Site; the possible displacement of these residences is analyzed below. If the Valley stable were removed from the park, the stable would no longer operate; these employee residences would no longer be needed and would not be replaced elsewhere in the park or in the El Portal Administrative Site.

Under Alternative 3, the Yellow Pine Campground would be zoned 2A and could be relocated from the corridor to another location in the Valley or could be removed from the park altogether.

If Yellow Pine were relocated elsewhere in the Valley, there would be no net loss of volunteer camping compared to the No Action Alternative. If Yellow Pine were removed from the park altogether, there would be a net loss of volunteer camping in the Valley. This would have a long-term, negligible, adverse impact on the local social environment of Yosemite Valley.

In Section 35 in Wawona, a nominal number of park-owned residences are located within the Merced River corridor and River Protection Overlay and would be inconsistent with the 2B zoning prescription and River Protection Overlay applied to that area. Under Alternative 3, these employee residences could be relocated, resulting in the displacement of the residents.

Under Alternative 3, the El Portal Trailer Village would be inconsistent with the 2B zoning prescription and could be removed. The National Park Service and concessioner residences at the El Portal Trailer Village could be replaced outside of the river corridor in El Portal.

Generally, development of replacement employee housing in El Portal would not be consistent with the predominantly 2C management zoning in this area under Alternative 3. However, limited areas are available in El Portal where employee housing could be developed. Although it is unknown where the displaced employee housing would be relocated, some or all of the housing units could be located in El Portal. The social environment in El Portal would experience long-term, minor, adverse impacts associated with the removal of housing in El Portal (although some of the housing could be rebuilt in El Portal) and there would be limited impacts on community amenities from the potential relocation of displaced employee housing from the Valley and Wawona to this community. Eligible residents who might be effected by actions of this plan, and who meet the compensation criteria under provisions of the Uniform Relocation Act, may be eligible for housing and moving benefits, although this would not be expected to lower the intensity of the impact.

Employee commuting distances and costs would increase if employee housing were relocated out of Yosemite Valley and Wawona. Yosemite Valley employees, for example, would experience an hour commute each day from El Portal, and Wawona employees would experience an approximately two-hour daily commute from El Portal.

The relocation of employee housing and associated effects on employee commutes would be a long-term, negligible, adverse impact on the local social environments of Yosemite Valley and Wawona, because only a small number of employee residences in these communities would be affected. In Yosemite Valley and Wawona, less than 5% of government-owned housing would be affected. Eligible residents who might be effected by actions of this plan, and who meet the compensation criteria under provisions of the Uniform Relocation Act, may be eligible for housing and moving benefits, although this would not be expected to lower the intensity of the impact.

Summary of Alternative 3 Impacts. The social environment in El Portal would experience long-term, minor, adverse impacts associated the removal of housing in El Portal (although some of the housing could be rebuilt in El Portal), and there would be limited impacts on community amenities from the potential relocation of displaced employee housing from the Valley and Wawona to this community. The loss of Yellow Pine Campground and the relocation of

employee housing and associated effects on employee commutes would be a long-term, negligible, adverse impact on the local social environments of Yosemite Valley and Wawona.

Cumulative Impacts. Cumulative effects on the social environment discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to this environmental discipline.

Past Actions. A substantial number of concession beds were damaged by the 1997 flood and were subsequently removed. The majority of the removed concession beds were replaced with temporary beds for concession employees, although not all of the beds were replaced, which resulted in a net loss of concessioner housing in Yosemite Valley. The loss of housing and the replacement of permanent housing with temporary housing has had a local, long-term, adverse effect on the social environment of Yosemite Valley.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the social environment include:

- Yosemite Area Regional Transportation System (YARTS)
- Merced River Canyon Trail Acquisition (BLM)

Implementation of YARTS would provide additional transportation options for employees and community residents. YARTS could somewhat improve the commuting conditions of employees by providing regional transportation alternatives for those employees resulting in a regional, long-term, beneficial impact on employee commutes.

The Bureau of Land Management's Merced River Canyon Trail Acquisition would allow for the development of a recreational trail west of the El Portal Administrative Site. This project would somewhat improve community amenities in El Portal, resulting in a local, long-term, beneficial impact on the social environment of El Portal.

A reasonably foreseeable future project that could have an adverse effect on the social environment includes:

- The Yosemite View parcel land exchange, El Portal (NPS)

The Yosemite View parcel land exchange would somewhat reduce the amount of open space available to the community of El Portal, although the proposed motel development would incorporate a public trail system and limited nature/river interpretive areas. This project would result in a local, long-term, adverse impact to the social environment of El Portal. This would result from the strain on limited community amenities in El Portal, loss of open space, and the opportunity cost of removing the National Park Service Parkline land from consideration for other community needs.

A reasonably foreseeable future project that could have a mixed effect on the social environment includes:

- *The Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would remove substantial amounts of employee housing from Yosemite Valley, and would construct new employee housing in El Portal and Wawona, among other locations. However, it is acknowledged that some of the proposed redevelopment in El Portal, for example, the redevelopment of the El Portal Trailer Village, would not be compatible with the management zoning in Alternative 3 of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The National Park Service would continue to strive to remove employee housing and administrative functions from Yosemite Valley, and relocate such functions to the El Portal Administrative Site, which was established by Congress for such purposes. The *Yosemite Valley Plan* could have a local, long-term, beneficial or adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona, depending upon the specific actions recommended by the plan and whether the structure of the communities (e.g., overall numbers of residences, adequacy of community amenities) would be affected.

The cumulative projects would have a regional, long-term, negligible, beneficial impact on employee commuting conditions due to the provision of regional transportation alternatives. The cumulative projects would have a local, long-term, minor, adverse effect on the social environments of Yosemite Valley and El Portal due to past loss of employee housing in Yosemite Valley and a reduction in the amount of open space in El Portal due to the land exchange, although this would be somewhat offset by the trail acquisition project.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residences could be relocated under Alternative 3 by providing regional transportation alternatives for those employees. Alternative 3 and the cumulative projects would have a local, long-term, minor, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and increases in commuting time in Yosemite Valley and Wawona, and a potential increase in housing in El Portal (resulting in a strain on the limited community amenities of El Portal).

Conclusions. The social environment in El Portal would experience long-term, minor, adverse impacts associated the removal of housing in El Portal (although some of the housing could be rebuilt in El Portal) and the strain on limited community amenities from the potential relocation of displaced employee housing from the Valley and Wawona to this community. The loss of Yellow Pine Campground and the relocation of employee housing and associated effects on

employee commutes would be a long-term, negligible, adverse impact on the local social environments of Yosemite Valley and Wawona.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residences could be relocated under Alternative 3 by providing regional transportation alternatives for those employees. Alternative 3 and the cumulative projects would have a local, long-term, minor, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and increases in commuting time in Yosemite Valley and Wawona, and a potential increase in housing in El Portal (resulting in a strain on the limited community amenities of El Portal).

Visitor Populations

Analysis

General Impacts. Under the application of management zones for Alternative 3, a substantial number of Yosemite Lodge units and the majority of Housekeeping Camp units would be located in an incompatible 2B zone. The North Pines Campground, approximately half of the campsites in Lower Pines Campground, and about one-third of the campsites at Wawona Campground would be located in an incompatible 2B zone and/or the River Protection Overlay. Under Alternative 3, these facilities could possibly be relocated from the corridor to elsewhere in the park or removed from the park altogether.

Based on the management zoning under Alternative 3, the number of overnight accommodations in the park could be reduced from the in-park accommodation levels in Alternative 1. A decrease in these facilities would shift the mix of park overnights and day visitors. It is assumed that the total number of annual visitors would be the same as under Alternative 1.

Should the overnight accommodation facilities that are inconsistent with the management zone prescriptions be relocated from the Merced River corridor to elsewhere in the park, there would be no net loss of park accommodations. The composition of the Yosemite visitor population (the ratio of park overnights to day visitors) and visitor spending would not differ from Alternative 1.

Should the overnight accommodation facilities that are inconsistent with the management zones be removed from the park altogether, the total number of in-park accommodations would decrease. There would likely be a shift in the Yosemite visitor population such that there would be a decrease in park overnights and an increase in day users. Conservatively assuming that those park accommodation facilities that could be removed under Alternative 3 would be removed, the shift in the Yosemite visitor population would constitute a long-term, moderate, adverse impact on park overnight visitors due to the permanent decrease in overnight accommodations. The decrease in park accommodations would be clearly detectable and would have an appreciable effect on park overnight visitors. Individuals displaced from Housekeeping Camp might not be able to find comparably priced lodging elsewhere in the region and could decide not to visit the park. Given the high demand for park visitation, visitors who chose not to visit the park would likely be replaced by other day visitors.

It is expected that displaced park overnighers would instead stay in gateway communities. In the short term, some visitors that may wish to lodge overnight in the region could become day visitors due to a lack of lodging capacity, particularly during the peak season. In the long-term, however, the regional lodging market would respond to visitor demand, and displaced day visitors could become local overnighers.

As with Alternative 1, no changes in Yosemite visitor spending behavior would be expected. No major changes are proposed that would alter the types of goods and services available to visitors. Zoning prescriptions under this alternative would not exclude or attract any different visitor groups or appreciably change the character of the “average” Yosemite visitor. Therefore, visitor spending patterns and estimates based on the 1998 YARTS survey are appropriate for estimating future visitor spending behavior. Based on the YARTS visitor survey, local overnighers generally spend more than park overnighers during their trip, who in turn generally spend more than day visitors (see table III-20 in Chapter III, Affected Environment). Compared to Alternative 1, it is expected in the short term that visitor spending would decrease somewhat, because former park overnighers would become day visitors. In the long run, however, visitor spending would increase somewhat, because former park overnighers would become local overnighers. Impacts to the regional economy associated with changes in visitor spending are discussed below under the heading “Regional Economy.”

Impacts on Low-Income Populations. Potential impacts on low-income populations that visit the park are related primarily to the availability and cost of overnight accommodations, and the range of available low-cost recreation activities. Low-income populations are currently underrepresented in the park compared to the state as a whole, and compared to the five counties surrounding the park. However, no information is available to precisely identify the visitation patterns of low-income visitors, such as where they stay and what activities they enjoy in the park. Therefore, the potential impact of a change in lodging or recreation opportunities on low-income populations cannot be quantified.

In the absence of precise data, this analysis assumes that low-income visitors favor lower-cost accommodations, such as camping or lodging at Housekeeping Camp, and inexpensive activities such as swimming, wading, or hiking. Alternative 3 would likely have long-term, minor, adverse effects on the availability of inexpensive activities (by, for example, placing limitations on formal picnicking facilities in 2A and 2B zones in the Merced River corridor). Alternative 3 could result in a decrease the number of campsites and a loss of the majority of Housekeeping Camp units, which would have a long-term, minor to moderate, adverse impact on low-income visitors. The intensity of the impact would depend on the extent of the decrease of such units. Low-income visitors displaced from the park because of a lack of access to low-cost accommodations could choose to stay in relatively inexpensive lodging facilities outside the park, such as campgrounds run by the U.S. Forest Service. However, the additional expense of traveling to and from the park would likely cause some low-income visitors to shorten their visit to the park or to avoid it altogether. Therefore, Alternative 3 could result in a decrease in the total number of low-income visitors to the park.

Summary of Alternative 3 Impacts. Under Alternative 3, the number of overnight accommodations in the park could be maintained or reduced from that under Alternative 1. Should the total number

of in-park accommodations remain the same, the composition of the Yosemite visitor population would not differ from that under Alternative 1. Should the total number of in-park accommodations decrease, there would be a local, long-term, moderate, adverse impact on overnight park visitors.

Alternative 3 would likely have an adverse effect on low-income populations due to reduced availability of inexpensive activities and a decrease in the total number of campsites and loss of the majority of the Housekeeping Camp units. This would have a long-term, minor to moderate, adverse impact on low-income visitors. The intensity of the impact would depend on the extent of the decrease of such units.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the visitor populations.

Past Actions. Upper and Lower River Campgrounds were damaged by the 1997 flood and have been closed to visitors. In addition, a substantial number of units at the Yosemite Lodge were damaged during the flood, and have been removed. Closure of these campgrounds and lodging units reduced the number of in-park camping accommodations available in Yosemite National Park, further exacerbating unmet demand for accommodations in the park. Closure of these facilities has had a local, long-term, adverse effect on park overnights, due to the clearly detectable reduction in park accommodations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have an adverse effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the visitor population include:

- Yosemite Area Regional Transportation System (YARTS)
- Wawona Campground Improvement (NPS)

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley when the Restricted Access Plan were implemented. It is anticipated that the regional, long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

The Wawona Campground Improvement project would improve the existing camping facilities at Wawona Campground and would construct additional campground facilities in Section 35 in Wawona. This project would have a local, long-term, beneficial impact on the visitor population by increasing the number of campsites in the park.

A reasonably foreseeable future project that could have an adverse effect on the visitor population includes:

- The Yosemite Valley Plan (NPS)

Overall, the *Yosemite Valley Plan* would substantially reduce the number of lodging facilities and nominally reduce the number of campsites in Yosemite Valley, although this plan would increase the number of lodging units at Yosemite Lodge. However, it is acknowledged that some of the components of the *Yosemite Valley Plan*, for example, the expansion of a portion of Yosemite Lodge and the development of Camp 6, would not be compatible with the management zoning in Alternative 3 of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* would likely have a local, long-term, adverse impact on the visitor population due to a likely reduction in the number of overnight accommodations in the Valley.

The cumulative projects would have a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Given the reduction in the number of lodging and camping units from the 1997 flood and the potential reduction in overnight accommodations due to the *Yosemite Valley Plan*, these cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to decreased opportunities to lodge and camp in the Valley, although this would be somewhat offset by increased camping opportunities in Wawona.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 3 and the cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to a past reduction of accommodations in Yosemite Valley, the potential reduction in overnight accommodations due to the *Yosemite Valley Plan*, and the potential reduction in the number of lodging and camping units in the Merced River corridor resulting from the application of the management zoning under Alternative 3.

Conclusions. Under Alternative 3, the number of overnight accommodations in the park could be maintained or reduced from that under Alternative 1. Should the total number of in-park accommodations remain the same, the composition of the Yosemite visitor population would not differ from that under Alternative 1. Should the total number of in-park accommodations decrease, there would be a local, long-term, moderate, adverse impact on overnight park visitors.

Alternative 3 would likely have an adverse effect on low-income populations due to reduced availability of inexpensive activities and a decrease in the total number of campsites and loss of the majority of the Housekeeping Camp units. This would have a long-term, minor to moderate,

adverse impact on low-income visitors. The intensity of the impact would depend on the extent of the decrease of such units.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 3 and the cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to a past reduction of accommodations in Yosemite Valley, the potential reduction in overnight accommodations due to the *Yosemite Valley Plan*, and the potential reduction in the number of lodging and camping units in the Merced River corridor resulting from the application of the management zoning under Alternative 3.

Regional Economy

Analysis

General Impacts. As stated in the discussion of the Visitor Populations, the number of overnight accommodations in the park could be maintained or reduced from that under Alternative 1. Should the total number of in-park accommodations remain the same under Alternative 3, Yosemite visitor spending in the region would not be expected to differ from Alternative 1.

Should the total number of in-park accommodations decrease, the Yosemite visitor population would be expected to shift; the number of park overnights would decrease and the number of day visitors would increase. In the short term, visitor spending would decrease somewhat compared to Alternative 1, because former park overnights would become day visitors, resulting in a negligible, adverse impact on the regional economy. In the long run, however, visitor spending would increase somewhat, because former park overnights would become local overnights, who generally spend more per capita than park overnights. This increase in visitor spending would have a negligible, beneficial effect on the regional economy. The shift in the number of park overnights as compared to day users that could result under Alternative 3 would not likely have a discernible effect on the regional socioeconomic environment, given the small magnitude of the potential shift in visitor spending as compared to the size of the regional tourist economy. In the long term, increased visitor spending in the affected region would negligibly increase output, income, and employment in the gateway region.

Alternative 3 could result in shifts in regional employment. Application of the management zone prescriptions could result in the closure of certain facilities (such as the Valley stable and the majority of Housekeeping Camp) and the development of other facilities, resulting in changes in employment within the park. In addition, potential changes in the composition of park overnights and local overnights could shift employment associated with overnight accommodations from within the park to the gateway region. These shifts in employment would constitute a long-term, negligible, beneficial impact on the regional economy. The impact would be beneficial, since it is unlikely that Alternative 3 would decrease regional employment compared to the No Action Alternative.

Implementation of Alternative 3 could result in limited construction activity, predominantly associated with the relocation or removal of facilities from the river corridor. Although the magnitude of the construction activity is not quantifiable, the activity would generate construction-related output, employment, and income in the regional economy. This would have a short-term, negligible, beneficial impact on the regional economy, due to the temporary nature of construction activity and the expected small magnitude of the construction activity compared with the size of the construction industry in the affected region.

Summary of Alternative 3 Impacts. Under Alternative 3, the number of overnight accommodations in the park could be maintained or reduced from that under Alternative 1. Should the total number of in-park accommodations remain the same, visitor spending in the region would not be expected to differ from that under Alternative 1. Should the total number of in-park accommodations decrease, Yosemite visitor spending would increase in the affected region, resulting in a long-term, negligible, beneficial effect on the regional economy. The impact would be negligible due to the small magnitude of the shift in visitor spending as compared to the size of the regional tourist economy.

Alternative 3 could result in shifts in regional employment, which would have a long-term, negligible, beneficial impact on the regional economy.

Implementation of Alternative 3 may result in limited construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the regional economy.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have a net mixed effect.

Reasonably foreseeable future projects that could have a cumulative beneficial effect on the regional economy include:

- Yosemite Area Regional Transportation System (YARTS)
- Development-related projects, such as Yosemite West Rezoning Application (NPS), Hazel Green Ranch (Mariposa Co.), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort, June Lake (Mono Co.), Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge Expansion (Tuolumne Co.), Hardin Flat Lodging and Conference Facilities (Tuolumne Co.), Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.), Silvertip Resort Village Project (Mariposa Co.)

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley if the Restricted Access Plan were implemented. It is anticipated that the long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

Several new lodging facilities are planned in the affected region, including tent cabins and hard-sided cabins at Hazel Green Ranch outside the park near the Big Oak Flat Entrance Station (Mariposa Co.), a hotel complex as part of the Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort in June Lake, Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge expansion near Camp Mather, a hotel in Hardin Flat, a motel and restaurant in Second Garrotte Basin (Tuolumne Co.), and the Silver Tip Resort Village Project in Fish Camp. Development of these facilities would expand the overnight lodging capacity of the gateway region. By providing local construction spending and employment during development, increasing lodging revenues and transient occupancy taxes, and providing sources of income and employment for area residents, these facilities would have a long-term, beneficial effect on the regional economy. The development of these facilities would increase demand for government services, including police, fire, and other services; it would be expected, however, that local government taxes assessed for these facilities would offset the incremental costs associated with providing such services.

A reasonably foreseeable future project that could have a cumulative mixed effect on the regional economy includes:

- *The Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would generate project construction spending and employment associated with implementation of the alternative, although it would also result in a decrease in in-park accommodations (and its associated visitor spending). However, it is acknowledged that some of the components of the Yosemite Valley Plan, for example, the expansion of a portion of Yosemite Lodge, and redevelopment of Camp 6 and the El Portal Trailer Village, would not be compatible with the management zoning in Alternative 3 of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* could have a local, long-term, beneficial or adverse effect on the regional economy, depending upon the specific actions recommended by the plan and whether the increased regional output and employment from expanded National Park Service in-park operations would be offset by the potential decrease in in-park accommodations (and its associated visitor spending).

These cumulative projects would have a short-term, minor, beneficial effect on the regional economy due to project construction spending and employment associated with implementation of the out-of-park lodging facilities. The cumulative projects would have a long-term, minor, beneficial effect on the regional economy due to increased access for day visitors to the park, increased lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the projects. Alternative 3 and the cumulative projects would result in a long-term, minor, beneficial impact on the regional economy due to increased visitor spending associated with Alternative 3, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Conclusions. Under Alternative 3, the number of overnight accommodations in the park could be maintained or reduced from that under Alternative 1. Should the total number of in-park accommodations remain the same, visitor spending in the region would not be expected to differ from that under Alternative 1. Should the total number of in-park accommodations decrease, Yosemite visitor spending would increase in the affected region, resulting in a long-term, negligible, beneficial effect on the regional economy. The impact would be negligible due to the small magnitude of the shift in visitor spending as compared to the size of the regional tourist economy.

Alternative 3 could result in shifts in regional employment, which would have a long-term, negligible, beneficial impact on the regional economy.

Implementation of Alternative 3 may result in limited construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the projects. Alternative 3 and the cumulative projects would result in a long-term, minor, beneficial impact on the regional economy due to increased visitor spending associated with Alternative 3, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Concessioner

Analysis

General Impacts. Under the application of management zones for Alternative 3, several facilities operated by the primary park concessioner would be inconsistent with the management zone prescriptions and could potentially be relocated from the corridor or removed from the park altogether. A substantial number of Yosemite Lodge units, the majority of the Housekeeping Camp units, and the Valley stable would be located in an incompatible 2B zone. Conservatively assuming that Alternative 3 could result in the discontinuation of over one-third of visitor lodging at Yosemite Lodge and the majority of visitor lodging at Housekeeping Camp, and the removal of the Valley stable, this alternative would have an adverse impact on concession revenues. In addition, the potential reduction in campsites would result in a loss of concessioner revenues associated with camper spending on food, beverages, and sundries, which would adversely affect concessioner revenues.

Under the current concession contract, a greater than 2% change in concession revenues would constitute a major impact for the primary park concessioner because of the high fixed costs experienced by the concessioner. This threshold provides a reasonable opportunity for net profit for the primary park concessioner in relation to capital invested and the obligations of the contract, as required by the National Park Service Concessions Management Improvement Act of 1998. Conservatively assuming the removal of all park concessioner facilities that would be inconsistent with the management zones, this alternative would decrease annual revenues (based on 1998 data) by about 12%. This would constitute a short-term, major, adverse impact on park concession operations. The impact would be short-term because it would extend through the period of the current park concession contract, which expires in 2008, after which a new contract would be negotiated. In the long-term, the impacts to the park concessioner would be unknown because the terms of the future contract are unknown.

Summary of Alternative 3 Impacts. Under Alternative 3, several primary park concession facilities would be inconsistent with the management zoning prescriptions under this alternative and could be relocated from the corridor or removed from the park altogether. Removal of all such facilities would constitute a short-term, major, adverse impact on primary park concessioner revenues.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to concessioner operations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net adverse effect; and (2) projects anticipated to have a net mixed effect.

A reasonably foreseeable future action proposed in the region that could have an adverse effect on the concessioner includes:

- Update to the *Yosemite Wilderness Management Plan* (NPS)

The update to the *Yosemite Wilderness Management Plan* (NPS) could restrict visitor use of the Merced Lake High Sierra Camp, resulting in closure of the camp to overnight lodging and a loss of revenues to the concessioner associated with providing overnight lodging services. The cumulative effect of the potential closure of Merced Lake High Sierra Camp would be a local, long-term, adverse impact on primary park concessioner revenues.

A reasonably foreseeable future action proposed in the region that could have a mixed effect on the concessioner includes:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* proposes changes to park facilities, including expanding Yosemite Lodge and relocating employee housing outside the Valley. However, it is acknowledged that some of the components of the Yosemite Valley Plan, for example, the redevelopment of the El Portal Trailer Village and expansion of Yosemite Lodge, would not be compatible with the management zoning in Alternative 3 of the *Merced River Plan/FEIS*. The *Merced River Plan*

guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 3 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* could have a local, long-term, beneficial or adverse effect on the primary park concessioner, depending upon the specific actions recommended by the plan and the extent to which these actions would affect the facilities operated by the concessioner.

The cumulative projects would have a local, long-term, negligible, adverse impact on the primary park concessioner associated with the possible closure of the Merced Lake High Sierra Camp to overnight lodging, and a loss of revenues to the concessioner associated with providing overnight lodging services.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in short-term, major, adverse impacts associated with the possible removal of facilities in Alternative 3 of the *Merced River Plan/FEIS* and the Merced Lake High Sierra Camp. The impact would be short-term because it would extend through the period of the current park concession contract. In the long-term, impacts to the park concessioner are unknown, because the terms of the future contract are unknown.

Conclusions. Under Alternative 3, several primary park concession facilities would be inconsistent with the management zoning prescriptions under this alternative and could be relocated from the corridor or removed from the park altogether. Removal of all such facilities would constitute a short-term, major, adverse impact on primary park concessioner revenues.

Alternative 3 and the cumulative projects within and in the vicinity of Yosemite National Park would result in short-term, major, adverse impacts associated with the possible removal of facilities in Alternative 3 of the *Merced River Plan/FEIS* and the Merced Lake High Sierra Camp. The impact would be short-term because it would extend through the period of the current park concession contract. In the long-term, impacts to the park concessioner are unknown, because the terms of the future contract are unknown.

Park Operations and Facilities

Analysis

The following discussion provides an overview of the types of impacts to park operations and facilities that could occur within each segment of the Merced River corridor from implementation of Alternative 3.

Impacts in Wilderness. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, and 1C, except at existing facilities, where the zoning would be 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning is not anticipated to alter visitor use patterns or facilities within wilderness

reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative. Consequently, the application of zoning within wilderness segments would have no effect on park operations or facilities. Development (short-term impacts) and implementation (long-term impacts) of the VERP framework for wilderness segments of the main stem and South Fork of the Merced River would require additional staff commitments, resulting in minor to moderate, adverse impacts on park operations (primarily resources management, interpretation, and protection staff).

Impacts in Yosemite Valley. The proposed zoning of Yosemite Valley in combination with the VERP framework could alter facilities, management of visitors, and restoration activities within the Merced River corridor and could increase demand on park staff and facilities. A number of existing facilities (e.g., campsites at North Pines Campground, Housekeeping Camp, the concessioner stable) would be inconsistent with the proposed 2B zone for east Yosemite Valley and 2A zone for west Yosemite Valley and could be removed. Facility removal would increase demands on staff in the short term during planning, demolition, and restoration. The need for additional services (e.g., protection) could also increase immediately following facility removal, while park visitors become accustomed to the new setting. Although short-term demands on park operations and facilities would increase (a short-term, moderate, adverse impact), long-term maintenance requirements would decrease (a long-term, moderate, beneficial effect on maintenance operations).

Application of proposed management zoning and the River Protection Overlay under this alternative could decrease overnight accommodations in Yosemite Valley (campsites or structured lodging) over the long term compared to the No Action Alternative. Removed facilities would be precluded at other locations within the river corridor but could be relocated to unspecified locations elsewhere in the park, or not at all. If overnight accommodation facilities were removed from the river corridor and not relocated elsewhere in the park, then the number of park overnights would likely decrease and the number of day visitors, or more precisely, “local overnights,” would increase proportionally. Because there would be no reduction in the total number of visitors, demands on park staff would not decrease (compared to the No Action Alternative), but are expected to be redirected to other divisions. For example, reduction in the total number of overnight accommodations could reduce demand for maintenance and protection services at Valley campgrounds and lodging facilities, but could increase demand for interpretation, resource restoration, and road maintenance (e.g., visitors would need to make two trips per day between their out-of-park accommodations and park attractions, which could have a long-term, negligible to minor, adverse impact on park operations related to road maintenance).

Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed and not relocated elsewhere (and assuming no decrease in visitation), then demand for road maintenance, protection, and resources (restoration) staff could increase, as visitors unable to find an authorized place to park could circle the Valley (increasing road wear) or could decide to park in unauthorized/improper areas. This would have a long-term, minor, adverse impact on park operations in Yosemite Valley.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have short- and long-term, major, adverse impacts on park operations and facilities

because visitor use is relatively high (is expected to remain consistent or increase), access throughout the Valley is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. For example, if El Capitan Meadow (zone 2A) were managed to the desired condition (e.g., high-quality meadow habitat with low visitor encounters), demand on park operations (primarily protection and resources staff) would dramatically increase related to meadow restoration, patrolling (to discourage informal use of the meadow and informal parking), and direction of visitors to more appropriate areas. This effect would be most pronounced during initial application of VERP management actions, while park visitors became accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a major, long-term, adverse impact on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Impacts in the Merced River Gorge and El Portal. The majority of the gorge would be zoned (2A, 2A+, and 2B) consistent with existing conditions. The proposed zoning is relatively compatible (i.e., would not inherently set up management conflicts), and managing the gorge to its desired conditions would be uncomplicated. In addition, large portions of the gorge are relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on park operations and facilities for the gorge compared to the No Action Alternative.

Potential future actions (e.g., removal of Cascades Diversion Dam), or new or rehabilitated facilities (e.g., restrooms, roads) could occur consistent with the proposed management zoning and River Protection Overlay. If implemented, these future actions could create short-term, moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction/demolition. Because these potential actions would be implemented to protect resources (e.g., road repair could reduce erosion and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor to moderate and beneficial.

Application of the proposed Day Use (zone 2C), Discovery (zone 2B), and Park Operations and Administration (zone 3C) zones in El Portal could decrease, increase, or have no net effect on development within El Portal compared to the No Action Alternative. An example of decreased operations is the application of the 2C zoning at the Sand Pit (currently used for construction staging and other administrative purposes). The current use of the Sand Pit would be inconsistent with the proposed 2C zoning and could be removed. Removal of facilities such as the Sand Pit would increase staff requirements in the short term (related to removal), but could decrease staff requirements over the long term (related to facility maintenance).

A similar situation would occur with the 2B zoning at the Trailer Village. The development would be inconsistent with the proposed zoning and could be removed. This could have short-term, adverse effects on park operations during planning, removal, and restoration, with a long-term, beneficial effect because maintenance of structures, utilities, etc. would be reduced. Because the management zoning does not specify specific actions, there would be no effect on development within El Portal and no impact on park operations and facilities compared to Alternative 1. Alternatively, if the 3C zones at Railroad Flat and old El Portal were fully built out or redeveloped, the demand on park operations and facilities would increase for El Portal

compared to the No Action Alternative. In the short term, resource, planning, and facility staff would be required to accommodate construction of new facilities (short-term, moderate, adverse impact). Over the long term, demand on protection and maintenance staff would increase proportional to development, resulting in a long-term, moderate, adverse impact on park operations and facilities.

Visitation to the gorge and El Portal could increase as a result of decreased parking, lodging, and other facilities within Yosemite Valley. If use of the gorge and El Portal increased, it is reasonable to assume that demand for parking, interpretation, and recreational opportunities would increase proportionally. As the demand for parking increases, use of existing parking facilities as well as unauthorized/improper areas would increase. Increased use of either would increase the need for maintenance. Increased parking in unauthorized/improper areas also could decrease visitor safety (e.g., parking at unauthorized locations along El Portal Road could increase vehicle accidents and vehicle-visitor conflicts) and degrade natural areas (e.g., directly as a result of parking on natural vegetation, indirectly by the creation of informal trails from unauthorized/improper parking areas to park destinations). These in turn would increase demand on protection (enforcement), maintenance, and resource (restoration) services. The effects on park operations and facilities would be directly related to the change in visitation within the gorge and El Portal and could result in long-term, minor to major, adverse effects. These impacts would be concentrated in areas of relatively easy access (e.g., along the El Portal Road). A majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on park operations and facilities at these locations.

Development of the VERP framework and its implementation within the gorge and El Portal is considered to have only minor, adverse impacts on park operations and facilities, because visitor use is relatively low and is expected to remain relatively low due to access and topography constraints.

Impacts in Wawona. The majority of Wawona would be zoned 2B (Discovery). Portions of existing facilities, such as Wawona Campground, Wawona Picnic Area, Wawona maintenance yard, and the Pioneer Yosemite History Center, would be inconsistent with the proposed management zoning and River Protection Overlay and could be removed. Demand for park operations, facilities, and resource staff would likely increase in the short term during removal (short-term, minor to moderate, adverse impact). However, the long-term effect of removal or relocation is considered only negligible to minor and adverse because these facilities could be relocated elsewhere outside the corridor.

Potential future actions (e.g., removal or replacement of Wawona Bridge, construction of new restrooms) could occur consistent with the proposed management zoning and River Protection Overlay. If implemented, these future actions could create short-term, minor to moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction/demolition. Because these potential actions would be implemented to protect resources (e.g., bridge replacement to restore the free flow of the river and decrease erosion, scour, and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor to moderate and beneficial.

Visitation to Wawona could increase as a result of decreased parking, lodging, and other facilities within Yosemite Valley. If use of Wawona increased, it is reasonable to assume that demand for parking, interpretation, and recreational opportunities would increase proportionally. The effects on park operations and facilities would be directly related to the change in visitation within Wawona and could result in long-term, minor to major, adverse effects.

Development of the VERP framework and its implementation within Wawona under Alternative 3 is considered to have only minor, adverse impacts (both short-term and long-term) on park operations and facilities, because visitor use is relatively low (and dramatic change in visitor use patterns for Wawona under this alternative is considered speculative) and because the proposed management zoning is designed to facilitate implementation of the VERP framework over the long term (e.g., the zoning is relatively compatible and would not inherently set up management conflicts between zones).

Summary Alternative 3 Impacts. In total, application of management zoning and the River Protection Overlay, in combination with development and implementation of the VERP framework, would substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by the increased need for research, planning, and monitoring to establish scientifically based indicators, standards, and monitoring protocols for the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones and the River Protection Overlay to their desired conditions would further increase demand on park staff and resources. Overall, implementation of VERP, in combination with other management elements proposed under Alternative 3, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Impacts would be most pronounced in Yosemite Valley, where visitor use is more concentrated, but would affect the entire corridor to some degree. Visitation of Wawona, the gorge, and El Portal could increase if visitors were displaced from Yosemite Valley. The effects on park operations and facilities would be directly related to the change in visitation and could result in long-term, minor to major, adverse effects.

Cumulative Impacts

Cumulative effects on park operations and facilities discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the immediate Yosemite region in combination with potential effects of this alternative. The extent to which past, present, or reasonably foreseeable projects could have a cumulative effect, when combined with other actions that could result under present National Park Service management strategies, is determined largely by whether such projects would affect demand for park operations services and facilities. For example, effects of projects that change the number of vehicles traveling through the park could combine with effects of the *Merced River Plan* to either increase or decrease the need for maintenance activities on roads and bridges. Similarly, projects that affect demand for other park operations services and facilities could also have a cumulative effect. These services include maintenance of utility systems, provision of interpretation programs, visitor protection, and resource management.

Past Actions. Park operations and facilities have been affected by numerous past National Park Service management decisions made since the inception of the park. Primary among those, when considered in relation to the potential effects of the *Merced River Plan*, include relocating the National Park Service maintenance shops and warehouse to El Portal (mostly adverse), removal of the hydroelectric generating plant (mostly adverse), professionalization of law enforcement staff (mostly adverse), rehabilitation of the water and electric distribution systems (mostly beneficial), improved communication systems (cell phones and radios, mostly beneficial), relocating the National Park Service wastewater treatment facility from Yosemite Valley to El Portal (mostly beneficial), and implementation of the prescribed fire program (adverse and beneficial). Overall, there is no net adverse or beneficial effect of these past actions on park operations and facilities.

Present Actions. Present actions that affect park operations and facilities include planning related to the *Yosemite Valley Plan* (NPS) and the El Portal Road Reconstruction Project (NPS). The *Yosemite Valley Plan* has substantially increased demand on resource, facility, and planning staff. The El Portal Road Reconstruction Project (NPS) is currently underway and affects park operations and facilities because the reconstruction is placing some increased demand on park operations staff.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Projects that could have a cumulative, beneficial effect on park operations and facilities include those that could reduce the number of visitors entering the park, reduce the number or amount of facilities within the park, or reduce long-term maintenance activities. Examples of these types of projects include:

- Transportation projects including the Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS), and Evergreen Road Improvements (multi-agency, see Appendix G)
- Several Yosemite utility projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line, Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, and Hodgdon Meadows Water and Wastewater Treatment Improvements (NPS), and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Planning efforts, including the South Entrance/Mariposa Grove Site Planning (NPS), update to the *Yosemite Fire Management Plan* (NPS), update to the *Yosemite Wilderness Management Plan* (NPS), and *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

Although each of the aforementioned projects could have short-term, adverse effects associated with planning, construction, replacement, or rehabilitation, the general goal of each of these

projects is to reduce long-term maintenance. Therefore, these projects could have a long-term, beneficial, cumulative impact on park operations and facilities.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on park operations and facilities include:

- The Yosemite Area Regional Transportation System (YARTS), which has a goal of increasing transportation options and reducing reliance on automobiles in the area
- Planned rehabilitation of Tamarack Campground, Yosemite Creek Campground, Hodgdon Meadow Campground, Wawona Campground Improvement, and Bridalveil Horse Camp (NPS)
- Development-related projects such as Yosemite West Rezoning Application (Mariposa Co.); Crane Flat Campus Redevelopment (NPS, YNI); Tuolumne Meadows Development Concept Plan (NPS), Resource Management Building (NPS), Expansion of Mariposa County Transit System (Mariposa Co.); and University of California, Merced Campus (Merced Co.)

Cumulative effects of the campground rehabilitation projects could be mixed, combining both adverse and beneficial effects. For example, the rehabilitation of Tamarack Campground would have a short-term, adverse effect on park operations and facilities during planning and construction. Post-construction, maintenance would be reduced compared to existing conditions, resulting in a long-term, beneficial impact on park operations and facilities.

Reasonably foreseeable projects that could have an adverse effect on park operations and facilities include:

- The *Yosemite Valley Plan* (NPS), which would implement the goals of the 1980 *General Management Plan*
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several regional lodging projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Tioga Inn, Lee Vining (Mono Co.); Hazel Green Ranch (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.)
- Merced River Canyon Trail Acquisition (BLM)
- Sierra Nevada Framework for Conservation and Collaboration (USFS)

Each of these projects would increase demand for services and facilities and add to the cumulative, adverse impact on park operations and facilities. For example, the *Yosemite Valley Plan* could substantially increase demand on park operations and facilities in the short-term during planning, repair, rehabilitation, construction/demolition, and replacement of facilities (e.g., removal of the road through Stoneman Meadow, construction of new campsites, restoration of large areas of Yosemite Valley to natural conditions). However, it is acknowledged that several actions proposed under the *Yosemite Valley Plan* (e.g., consolidated parking facility at Yosemite Village) are not compatible with the management zones of Alternative 3. If Alternative 3 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 3. The effect on park operations and facilities would change, but the results of the change are speculative.

These past, present, and reasonably foreseeable future actions could have adverse, cumulative effects on park operations and facilities because of the increased demand on park operations services and facilities over both the short and long term. The combined effects of Alternative 3 with other cumulative projects would result in a long-term, moderate to major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Conclusions

Application of management zoning and the River Protection Overlay, in combination with development and implementation of the VERP framework, would substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by an increased need for research, planning, and monitoring to establish of scientifically based indicators, standards, and monitoring protocols for the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones and the River Protection Overlay to their desired conditions would further increase demand on park staff and resources. Overall, implementation of VERP, in combination with other management elements proposed under Alternative 3, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Impacts would be most pronounced in Yosemite Valley, where visitor use is more concentrated, but would affect the entire corridor to some degree. Visitation of Wawona, the gorge, and El Portal could increase if visitors were displaced from Yosemite Valley. The effects on park operations and facilities would be directly related to the change in visitation and could result in long-term, minor to major, adverse effects.

The combined effects of Alternative 3 with other cumulative projects would result in a long-term, moderate to major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Unavoidable Adverse Impacts

Under Alternative 3, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework.

The application of the River Protection Overlay could allow for the removal of human-made obstructions to the free-flowing condition of the river. If one or more of the historic bridges considered to be an obstruction to the free flow condition of the river were removed, then this would constitute an unavoidable adverse effect.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have an unavoidable adverse effect on park operations and facilities, because visitor use is relatively high (is expected to remain consistent or increase), access throughout the Valley

is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. This effect would be most pronounced during initial application of VERP management actions, while park visitors became accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a unavoidable adverse effect on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Irreversible and Irretrievable Commitments of Resources

This section identifies any resources that would be lost either temporarily or permanently as a result of Alternative 3. This alternative provides a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework.

The application of the River Protection Overlay could allow for the enhancement of natural resources in the river corridor. Therefore, no natural resources would be irreversibly or irretrievably committed as a result of Alternative 3.

The application of the River Protection Overlay provides for the possibility of removing human-made obstructions, which include historic bridges, within the river corridor. If any historic bridges were removed, then the loss of this cultural landscape resource would be permanent and irreversible.

If relocation of existing facilities and/or the development of new facilities within the river corridor occurred as a result of the management zoning designations under Alternative 3, then this would result in the expenditure of energy to relocate or develop the facility. In addition, if the relocation of existing facilities and/or the construction of new facilities occurred, then there would be an irreversible commitment of materials, such as concrete, asphalt, wood, and metal, that would be used in relocation or construction activities.

Relationship of Short-Term Uses of Man's Environment and Long-Term Productivity

This section compares the short- and long-term environmental effects of Alternative 3.

Under Alternative 3, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework. The application of the River Protection Overlay could have short-term adverse impacts and long-term beneficial impacts. Short-term

impacts could occur if obstructions in the river were removed and streambanks along the river were restored. These actions could temporarily adversely affect biological resources along the river, including vegetation and wildlife, as well as water quality. In the long term, if streambank restoration and obstruction removal occurred, then this would enhance the free-flowing condition of the river and natural resource Outstandingly Remarkable Values (e.g., biological, hydrologic processes, etc.). The intensity of the impact would depend on the level of streambank restoration and the number of obstructions removed. Also in the long term, benefits could occur to floodplains if the river were restored to natural geomorphic conditions, to water quality if human interaction with the river were limited, and to biological resources if wetland habitat for plant and animal species were restored.

Alternative 4: River Protection Emphasis, Wide Corridor

Alternative 4 provides maximum resource protection and restoration opportunities by including the largest possible area within the Merced River corridor boundaries and by applying restrictive zoning prescriptions within that boundary.

For the duration of the *Merced River Plan*, Alternative 4 would provide a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the visitor Experience and Resource Protection (VERP) framework. Compared to Alternative 1, which has no such management framework, this is considered to be a minor, beneficial impact for visitor experience, natural resources, cultural resources, social resources, and associated Outstandingly Remarkable Values.

Boundaries. This alternative applies a quarter-mile boundary throughout the length of the Merced River, the maximum allowed under the Wild and Scenic Rivers Act (see figures II-19 through II-22 in Chapter II, Alternatives). Changes to the boundaries proposed under this alternative would expand the area for which management zoning is applied compared to Alternative 1. Changes to the boundaries in combination with the application of restrictive management zoning would have beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and Outstandingly Remarkable Values. The change to the boundaries is discussed as appropriate under specific resource topics addressed for this alternative.

Classifications. Changes to the classifications (shown in figure II-3) proposed under this alternative would have no effect on visitor experience, natural, cultural, and social resources or associated Outstandingly Remarkable Values. Changes to classifications proposed under Alternative 2 (east Yosemite Valley and Wawona are reclassified from scenic to recreational) are technical corrections made when the boundary was extended to the full quarter-mile and reflect existing access to the Merced River, shoreline development, and watershed development within these segments. Changes to the classifications would not alter management or protection of the east Yosemite Valley or Wawona river segments. The change to the classifications is not discussed further in this alternative.

Outstandingly Remarkable Values. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised in this alternative based on the application of new scientific information, changed conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act (refer to Appendix E for a history of the Outstandingly Remarkable Values). Specifically, those resources that are not directly related to the Merced River (e.g., western juniper, air quality, skiing, rock climbing) or are not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these

resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., 1916 Organic Act, Federal Endangered Species Act, Clean Water Act). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*. The change in Outstandingly Remarkable Values is discussed as appropriate under specific resource topics addressed for this alternative.

Section 7 Determination Process. The application of the consistent Section 7 determination process for water resources projects would provide a negligible, beneficial impact on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values compared to Alternative 1 because management direction for future water resources would be provided. Application of the consistent Section 7 determination process is discussed as appropriate under specific resource topics addressed for this alternative.

Management Zoning. Management zoning could have long-term, beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values within the Merced River corridor. This management element would limit the type of new facilities that could be built, would encourage the removal of inconsistent facilities, and would allow new development or redevelopment as appropriate. Management zoning is discussed as appropriate under specific resource topics addressed for this alternative.

River Protection Overlay. The River Protection Overlay could have long-term, beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values within the Merced River corridor. This management element would limit the type of new facilities that could be built, would minimize adverse effects of new facilities (e.g., bridges, roads) to Outstandingly Remarkable Values and the free-flowing condition of the Merced River, and would encourage the removal of inconsistent facilities. This management element is discussed as appropriate under specific resource topics addressed for this alternative.

Visitor Experience and Resource Protection. Implementation of the VERP framework would have beneficial and adverse impacts on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values. The VERP framework protects both park resources and visitor experience, with particular focus on the Outstandingly Remarkable Values, from impacts associated with visitor use, and helps managers address issues associated with visitor use. The VERP framework is discussed as appropriate under specific resource topics addressed for this alternative.

Natural Resources

Geology, Geohazards, and Soils

Analysis

General Impacts. Geologic resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., cirques, paternoster lakes) or not unique to the region or nation have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*), as well as by federal law (the Organic Act, Wilderness Act). Geologic-process Outstandingly Remarkable Values include the mature, meandering nature of the Merced River through Yosemite Valley, a classic V-shaped river through the gorge, evidence of ice-age glaciation (U-shaped and hanging valleys), and extraordinary granite features (i.e., exfoliation domes). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Rockfall Hazards. Under Alternative 4, facilities could be restricted or be relocated or from ecologically vulnerable areas along the Merced River and South Fork to areas susceptible to the risks of rockfalls. Most rockfalls occur from steep granite cliffs and are associated with natural triggering events such as earthquakes, climatic changes, rainfall events, or gradual stress release and exfoliation of the granite. Relocation of facilities into rockfall-susceptible areas would be expected to occur primarily in Developed zones (3A-3C) such as Yosemite Valley, the Merced River gorge, and possibly along the South Fork in the Wawona area. In developed areas where the river corridor extends to one-quarter mile on each side of the river, Alternative 4 would limit the areas that could support certain visitor and operation facilities. This would occur primarily in Diverse Visitor Experience zones (2A-2D) and Developed zones (3A-3C) such as Yosemite Valley, the Merced River gorge, and possibly along the South Fork in the Wawona area. For instance, Alternative 4 could rezone some Yosemite Valley non-wilderness areas to Open Space (2A) or Discovery (2B), thus reducing or eliminating certain visitor facilities and the overall risk of rockfall hazards in developed areas. Rockfall hazards would continue in the upper wilderness reaches of the Merced and South Fork, zoned as Wilderness (1A-1D), but the potential for impacts to visitors and facilities would be low and would not change from Alternative 1. Under Alternative 4, the National Park Service could retain and revise current management guidelines pertaining to geologic hazards and resources, such as those policies implemented to protect visitors and reduce damage to park infrastructure. If relocation of existing facilities out of the floodplain were to occur, the National Park Service could conduct appropriate studies to determine proximity of the facility to the high-risk rockfall zones and the stability of the adjacent rock cliffs.

Considering the unpredictable and unavoidable nature of rockfalls throughout Yosemite National Park, and considering that some visitor facilities will either be restricted or relocated outside the corridor, Alternative 4 would result in a long-term, minor, beneficial impact on public safety from hazards associated with rockfall events.

Seismic Hazards. Historically, seismic events in the Sierra Nevada and Yosemite National Park have been relatively infrequent; however, when they do occur, the resultant groundshaking is capable of triggering rockfalls and producing ground accelerations that are higher than some older, less structurally stable buildings can tolerate. Typically, the seismic risks of injury to visitors and damage facilities would occur in the developed portions of Yosemite National Park such as Yosemite Valley, El Portal, and Wawona. In these areas, buildings and other facilities placed within saturated alluvial soil (for instance within the floodplain of the Merced River) could also be susceptible to secondary hazards from seismic groundshaking, including liquefaction and seismically induced settlement. For example, within Yosemite Valley, any potential facility development at Camp 6 (zone 3C) would require construction within alluvial sediments that could be susceptible to effects of unstable soils (such as settlement) and, in the event of significant groundshaking, the effects of liquefaction. In undeveloped areas where visitor use is relatively low (for instance, in the upper wilderness reaches of the Merced River and the South Fork), groundshaking effects from seismic events would result in a lower potential for injury and structural damage.

Under Alternative 4, earthquakes in the Sierra Nevada region would continue to expose visitors to potential injury in unstable buildings or to hazards from seismically triggered mass movement of rock slopes. In the upper wilderness reaches of the Merced River, Yosemite Valley, the Merced River gorge, and along the river canyons of the South Fork, earthquakes could trigger rockfalls and subject the area to seismic shaking. In Yosemite Valley and in Wawona on the South Fork, seismic shaking could also be responsible for instability of certain alluvial soils. Under Alternative 4, facilities could be removed from the corridor, thus reducing the risks of secondary hazards from seismic shaking, including liquefaction and seismically induced settlement. Considering the potential for earthquake events in the Sierra Nevada, their unpredictable nature and unavoidable effects, Alternative 4 would have no impact on public safety related to seismic hazards compared to Alternative 1. However, given that under Alternative 4 more restrictive management zoning could limit facilities, and redistribute or reduce the number of visitors in the corridor, Alternative 4 would also result in beneficial effects to public safety from seismic hazards. Therefore, Alternative 4 would have a long-term, minor, beneficial impact on public safety associated with seismic hazards.

Impacts to Soil. Construction excavation and replacement of native soils with engineered fills contribute to the reduction of local native soil. Excessive surface water runoff or loss of protective vegetation cover can cause erosion. Alternative 4 would result in a reduction and redistribution of visitors, concentrating them in more localized areas in the park and limiting their access within the corridor, especially in Yosemite Valley. In comparison, Alternative 4 provides for less Developed zones (3A-3C) than Alternative 1, and zones the non-wilderness areas as Discovery and Open Space (2A, 2B).

As a result of efforts to manage visitor use to protect natural and cultural resources within the Merced River corridor, including management zoning, the VERP framework, and the River Protection Overlay, soil erosion impacts due to visitor use and development projects would be less severe than under Alternative 1. The implementation of the VERP framework would have a long-term, moderate, beneficial impact on soil resources. For instance, if soil compaction were selected as an indicator of desired conditions under the VERP framework, violations of the standard associated with this indicator would result in management action to manage or limit visitor use in a particular area. The management action could be to install signs or fences directing visitor use toward resilient areas and away from sensitive resources.

Compared to Alternative 1, management zoning under Alternative 4 would place greater restrictions on uses and facility development within the Merced River corridor. These management zones, in combination with the VERP framework, would decrease adverse effects from erosion, compaction, and loss of surface soils. More restrictive management zoning for development and the consequential reduction of soil disturbance would result in a minor, beneficial impact on soil resources.

Summary of Alternative 4 Impacts. Compared to Alternative 1, rockfall hazards under Alternative 4 would result in a long-term, minor, beneficial impact, especially considering that under Alternative 4, facilities could be restricted or removed from the floodplain to areas susceptible to hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable, resulting in a potential adverse effects; however, Alternative 4 could also limit facilities, and redistribute or reduce the number of visitors in the corridor, thus reducing impacts related to the secondary effects of earthquakes. Therefore, Alternative 4 would have a long-term, minor, beneficial impact on public safety associated with seismic hazards. More restrictive management zoning for development, the VERP framework, the River Protection Overlay, and the consequential reduction of soil disturbance under Alternative 4 would result in a long-term minor, beneficial impact on soil resources compared to Alternative 1.

Considering the collective risks associated with rockfalls, seismic hazards, and impacts to soil resources, the implementation of potential future actions in accordance with the management zones of Alternative 3 would result in a long-term, minor, beneficial impact compared to Alternative 1.

Cumulative Impacts

Cumulative impacts to geological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect geological resources within the river corridor or in the park vicinity.

Various reasonably foreseeable future actions could eventually result in construction of additional structures and facilities within zones susceptible to adverse impacts from earthquakes and rockfalls. These facilities would likely be located in developed areas, including Yosemite Valley, the El Portal Administrative Site, and Wawona.

Past Actions. Development projects intended to serve park visitors in Yosemite National Park have included hotels, visitor centers, campgrounds, and bridges with associated roads and parking lots. In addition, facilities required for park infrastructure support, including employee housing, utility facilities, maintenance yards, and supply storage areas, have been developed throughout the park. As popularity of Yosemite attracted a greater number of visitors, the number and magnitude of these projects increased to meet visitor demand. Past actions have resulted in adverse impacts because projects were developed in areas that could be susceptible to damage from geohazards (rockfalls and seismic events), and facility development has contributed to the overall degradation of soil resources in the park.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects geology, geohazards, and soils. The reconstruction requires steepening the sheer rock slopes along the north side of the roadway, which increases the potential for rockfalls over the short term (by decreasing stability of the rock slopes). However, under the direction of engineers, design features for rock cuts along the El Portal Road (e.g., rock-bolting using 30-foot-long dowells) serve to increase the long-term stability of the rock slopes. These design features are also used to stabilize colluvial soil cuts, thereby reducing erosion. On the south side of the El Portal Road, shoulder widening requires construction of a fill slope that, in certain areas, encroaches into the Merced River. These effects are partially mitigated by implementation of standard design and construction-related best management practices. The project also involves rehabilitation of the sewerline, which reduces potential soil contamination, and the improvement of roadway drainage, thereby reducing erosion. The encroachment of the fill slope into the Merced River would cause minor obstruction to the free-flowing condition of the river. Overall, the El Portal Road Reconstruction (Segment D) Project would have a beneficial impact by reducing rockfall and soil erosion potential.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on geohazards and soil resources include:

- Several campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS), Tamarack Campground

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS), both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- Transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., potential short-term construction erosion and soil loss), an objective of each of these projects is to restore and manage natural resources and reduce soil degradation. Therefore, these projects could have a net long-term, beneficial, cumulative impact on soil resources.

Reasonably foreseeable projects that could have both adverse and beneficial effects on regional geology, geohazards, and soils include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and White Wolf Water System Improvements (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Wawona Campground Improvement (NPS)
- Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)
- Several water improvement projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the

Yosemite Valley Plan would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, projects under this plan would not increase rockfall and seismic hazards, and would have a beneficial impact by reducing degradation of soil resources in Yosemite Valley.

Cumulative effects of the above-referenced projects could be a combination of adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term benefit on soil resources by increasing coordinated management of natural resources. However, short-term adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project above Cascades Diversion Dam). The current approach for the Segment D widening would require redesign. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., steepening of sheer rock slopes, potentially leading to short-term, slope instability, and traffic circulation, safety, and noise impacts). The net effect of these projects is difficult to anticipate, but would likely result in an overall balance between beneficial and adverse effects. Reasonably foreseeable projects that could have an adverse effect on regional geology, increase the potential for impacts related to geologic hazards, and increase soil degradation include:

- Merced River Canyon Trail Acquisition (BLM)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of the City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak).

Certain development projects, as listed above, could expose additional visitors to risk of rockfall and seismic hazards and result in increased degradation of soil resources. Examples of projects that would result in a cumulative increase in park development include the construction of South Entrance/Mariposa Grove Site Planning (NPS), the new Resources Management Building (NPS), Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Crane Flat Campus Redevelopment (NPS); Hazel Green Ranch (Mariposa Co.), and the El Portal Road Reconstruction Project (NPS).

Considering that hazards from geological processes such as rockfalls and earthquakes are unavoidable and unpredictable, park visitors would continue to be exposed to injury and damage

from these hazards, thus resulting in a cumulative, long-term, adverse impact. The cumulative effect of future development actions would increase the overall depletion of soil resources by increasing soil removal, compaction, and erosion. Restoration projects may offset the rate of overall soil resource depletion, but not to the extent of providing a cumulative benefit. Future development projects would result in a cumulative, long-term, minor to moderate, adverse impact to soil resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

In combination, rockfall hazards under Alternative 4 and the cumulative projects would result in a long-term, minor, adverse impact to public safety throughout Yosemite National Park because some localized projects may reduce risks from rockfalls, and Alternative 4 could reduce and restrict development within the floodplain. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury. Therefore, Alternative 4 and the cumulative projects would have a long-term, minor, adverse impact to public safety associated with seismic hazards, considering the long-term, negligible, beneficial impact resulting from the reduced secondary seismic impacts in Alternative 4. Impacts to soil resources under the cumulative projects could be reduced by Alternative 4 management zoning, VERP, and the River Protection Overlay, and could be offset by the long-term, minor, beneficial impact in Alternative 4, thus resulting in a long-term, minor, adverse impact. Overall, Alternative 4 and the cumulative projects would have a long-term, minor, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor, adverse impact on soil resources.

Conclusions

Compared to Alternative 1, rockfall hazards under Alternative 4 would result in a long-term, minor, beneficial impact especially considering that, under Alternative 4, facilities could be restricted or removed from the floodplain to areas susceptible to hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable, resulting in a potential adverse effects; however, Alternative 4 could also limit facilities, and redistribute or reduce the number of visitors in the corridor, thus reducing impacts related to the secondary effects of earthquakes. Therefore, Alternative 4 would be considered to have a long-term, minor, beneficial impact on public safety associated with seismic hazards. More restrictive management zoning for development, the VERP framework, the River Protection Overlay, and the consequential reduction of soil disturbance under Alternative 4 would result in a long-term, minor, beneficial impact on soil resources compared to Alternative 1. Considered collectively, the risks associated with rockfalls, seismic hazards, and impacts to soil resources, the implementation of potential future actions, in accordance with the management zones of Alternative 4, would result in a long-term, minor, beneficial impact compared to Alternative 1.

In combination, rockfall hazards under Alternative 4 and the cumulative projects would result in a long-term, minor, adverse impact to public safety throughout Yosemite National Park because some localized projects may reduce risks from rockfalls, and Alternative 4 could reduce and restrict development within the floodplain. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury. Therefore, Alternative 4 and the cumulative projects would have a long-term, minor, adverse impact to public safety associated with seismic hazards, considering the long-term, negligible, beneficial impact resulting from the

reduced secondary seismic impacts in Alternative 4. Impacts to soil resources under the cumulative projects could be reduced by Alternative 4 management zoning, VERP, and the River Protection Overlay, and could be offset by the long-term, minor, beneficial impact in Alternative 4, thus resulting in a long-term, minor, adverse impact. Overall, Alternative 4 and the cumulative projects would have a long-term, minor, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor, adverse impact on soil resources.

Hydrology, Floodplains, and Water Quality

Analysis

General Impacts. Hydrologic-process Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that do not accurately reflect site conditions (e.g., excellent water quality in Wawona and below Wawona) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Clean Water Act, 1916 Organic Act). Hydrologic-process Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now generally include excellent water quality, exceptionally steep gradients, extraordinary examples of cascades, and examples of unique hydrologic conditions. The revised Outstandingly Remarkable Values provide greater focus on the Merced River and values unique to the region or nation than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to hydrologic processes that could occur within each segment of the Merced River corridor from application of management elements proposed in Alternative 4.

Impacts in Wilderness. Examples of hydrologic-process Outstandingly Remarkable Values of wilderness segments of the main stem and South Fork of the Merced River include glacial remnants, a logjam in Little Yosemite Valley that is hundreds of years old, and numerous cascades, steep gradients, and excellent water quality. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and River Protection Overlay are not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative, these management elements would limit the type of new facilities that could be built (e.g., large campsites with facilities are prohibited in the 1B zone), which could adversely affect hydrology, floodplains, and water quality under the No Action Alternative. Although actions such as trail rehabilitation could occur under the proposed zoning, these actions

would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values within wilderness segments of the Merced River (main stem and South Fork) by reducing visitor effects. For example, if VERP monitoring revealed elevated levels of fecal coliform bacteria in the Merced River due to visitor use (e.g., camping or hiking near the Merced River), VERP management actions (e.g., educational signs, limits on visitor use) could be implemented to achieve the desired condition for water quality in the management zone.

Impacts in Yosemite Valley. Hydrologic-process Outstandingly Remarkable Values within Yosemite Valley include the meandering river, world-renowned waterfalls, an active flood regime, oxbows, unique wetlands, and fluvial processes. Yosemite Valley would be zoned to protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning together with the River Protection Overlay in Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the River Protection Overlay) that have the potential to adversely affect hydrology, floodplains, and water quality. In addition, possible future actions (e.g., bridge removal, bridge or road reconstruction, construction of new campsites) that could occur under the proposed zoning would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- The River Protection Overlay could restore the river to more natural geomorphologic conditions through restoration of streambanks and the floodplain. The River Protection Overlay would promote natural processes in the river and floodplain and minimize the alterations of the floodplain due to existing and future facilities. An example of the potential benefit of the River Protection Overlay on the river's hydrologic process would be the potential removal or restriction of facilities near the banks of the river. Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay would allow natural floodplain alterations and lateral movement of the

river channel. It also would remove sources of pollutants (e.g., oil), reduce erosion and sedimentation (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation (streambank stabilization). The River Protection Overlay would have the potential to reduce visitor degradation of streambanks and the river channel by limiting the number of locations where human-induced erosion could occur. Additionally, the introduction of refuse and bacteria by visitors could be reduced by the possible realignment or relocation of roads, trails, and visitor facilities. The magnitude of the effect of the River Protection Overlay on hydrologic processes is correlated to the degree to which facilities are removed in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect, whereas removal of several facilities would have a moderate to major, long-term, beneficial effect on the hydrologic processes in Yosemite Valley, an Outstandingly Remarkable Value.

- The potential changes to existing and future structures and visitor use in the 100-year floodplain under Alternative 4 could provide a long-term, minor, beneficial impact in terms of flood protection for park personnel, visitors, and park structures. Flood frequency and hazards are issues in developed areas, such as east Yosemite Valley, where existing structures and visitor-use areas are subject to high water inundation. Alternative 4 would restrict the future placement of nonessential buildings, roadways, and visitor areas and potentially remove structures in the high-frequency flood areas of the River Protection Overlay. The River Protection Overlay provides a buffer area for natural flood flows and channel formation. Additionally, zones 2A and 2B in the larger floodplain would restrict the placement of park facilities in flood-prone areas. An example of this potential reduced pressure is the zoning of Housekeeping Camp as 2B, where lodging would be inconsistent with the allowable uses, and the removal of facilities could occur. The removal of facilities, restoration of the floodplain, and reduced visitor use of the area would allow a natural floodplain to form where unnatural barriers to flood flows would no longer be present. Overall, flood frequency would be unaffected, but implementation of the criteria for existing and future structures could reduce flood hazards in developed areas and return the flood regime to a more natural state. Alternative 4 could provide a major, long-term benefit to floodplain conditions.
- An example of the potential benefit to water quality would be the concentration of visitors and vehicles in the western portion of Yosemite Valley at Cathedral Beach (zoned 2C) and Sentinel Beach (zoned 2C). The designation of much of the river corridor in this area as Discovery (zone 2A) would focus visitor use to the 2C zones listed above. By limiting the currently dispersed use of the Merced River through this portion of Yosemite Valley to concentrated locations, nonpoint sources of pollution, such as refuse, bacteria, and petroleum and metal products associated with vehicles, would become more manageable.
- A majority of the 100-year floodplain in west Yosemite Valley would be zoned 2A and receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging) that have the potential to adversely affect floodplain characteristics (e.g., water recharge rates, flood dissipation), hydrologic processes of the Merced River (e.g., new facilities could constrict the channel of the Merced River), and water quality (e.g., short-term impacts during construction). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to be managed to their desired condition with continued protection, restoration, and enhancement of hydrologic processes, resulting in a long-term, minor to moderate, beneficial impact.

- El Capitan Meadow is a river-related meadow within the 100-year floodplain of the Merced River. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has compacted meadow soils, altering the natural water recharge capabilities of the floodplain at this location. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to more resilient locations outside the floodplain of the Merced River. This could increase opportunities for restoration of natural floodplain characteristics, resulting in a minor, site-specific, long-term, beneficial effect.
- A transit center/day-visitor parking facility would be precluded within the 2A and 2B zones in Yosemite Valley, and it is unlikely that adequate day-visitor parking areas could be established outside of the quarter-mile boundary to accommodate current or anticipated visitor demand. This could result in a significant reduction in the number of visitors to Yosemite Valley compared with existing conditions. As a result, many day visitors could be displaced to other parts of the park (e.g., Wawona, Tuolumne Meadows) or could be excluded from the park altogether. Although increased visitor use of areas outside of Yosemite Valley could have negligible to major, long-term, adverse effects (depending on site-specific conditions and level and type of use), reducing the number of visitors to Yosemite Valley could have minor to moderate, long-term, beneficial effects on water quality and hydrologic processes in Yosemite Valley by reducing visitor-related impacts such as erosion, refuse, and introduction of nonpoint-source pollutants.

Examples of how management elements proposed under this alternative could have negative effects on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- A long-term, minor, adverse impact to water quality could occur as a result of the continued and likely increase of nonpoint-source pollution discharge to stormwater runoff from roads, parking lots, and other impervious surfaces introduced into the area to accommodate visitor use. If parking lots, roads, and other impervious surfaces were established where none currently exist, then vehicle-related pollutants and refuse would accumulate. This long-term, minor, adverse impact could be mitigated to a negligible level through the use of permeable surfaces and vegetated or natural filters or traps for filtering stormwater runoff. Other best management practices (Chapter II) for polluted runoff control include oil/sediment separators, street sweeping, and infiltration beds (soil capture of surface pollutants).
- Development of a transit center and/or day-visitor parking facility at Camp 6 or Taft Toe in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park could circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas could increase erosion and sedimentation to the river and its tributaries. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be negligible, since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short term in duration due to implementation of

the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.

- Localized, short-term, minor, adverse impacts on water quality could occur from construction and demolition involving river impoundments, obstructions, or work within the river corridor. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade water quality. The application of construction/demolition best management practices (Chapter II) could lessen the potential for impacts to water quality. Implementation of a Storm Water Pollution Prevention Plan, as prescribed for all construction activities affecting over five acres (to be reduced to one acre in 2003) by the Environmental Protection Agency and the Regional Water Quality Control Board, would help to reduce potential short-term impacts on water quality due to construction activities. Storm Water Pollution Prevention Plans include best management practices for erosion control and containment of potential water quality pollutants. Such measures could reduce the potential adverse impacts to a negligible intensity.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on hydrology, floodplains, and water quality, depending on site-specific conditions and project design. If actions resulted in relocation outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal regulations (e.g., the Clean Water Act, Executive Order 11988 on floodplain management, and the *Floodplain Management Guidelines*).
- Relocation of facilities to other locations within the river corridor could have site-specific, long-term, negligible to major, adverse effects on hydrology, floodplains, and water quality, depending on site-specific conditions and project design. If actions resulted in relocation within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.

Although site-specific, short- and long-term, negative effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 4 and the reduction in visitors to the Valley would provide increased protection for these river processes and associated Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of hydrologic process Outstandingly Remarkable Values of the gorge and El Portal include exceptionally steep gradients (2,000-foot elevation drop in approximately six miles) and continuous rapids. The majority of the gorge would be zoned (2A, 2A+, and 2B) consistent with current visitor use and facilities. El Portal would have a base zone of 2C, with large tracts zoned 3C. Examples of how the management elements of Alternative 4 would affect hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values of the Merced River Gorge and El Portal are provided below.

- Existing facilities, such as Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flow condition, of the Merced River and return this portion of the river to a

more natural condition thereby enhancing the hydrologic processes of this river segment and resulting in minor to moderate, site-specific, long-term, beneficial effect. Minor, short-term, adverse effects to water quality (e.g., sedimentation, oil, grease) could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).

- The majority of the gorge is relatively inaccessible, and visitor use and facilities are unlikely to increase. Consequently, there would be no impact on hydrology, floodplains, or water quality for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with the natural hydrologic processes of the Merced River at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location, resulting in a site-specific, minor, beneficial effect.
- Portions of El Portal within the floodplain of the Merced River would be zoned 3C (e.g., Railroad Flat, old El Portal), which could allow additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., alteration of floodplain characteristics, alteration of hydrologic processes), minor to moderate, adverse effects on hydrology, floodplains, and water quality. Adverse impacts on water quality (e.g., sedimentation, oil, grease, fuels) would be related to construction (short-term) and use (long-term) of facilities. Adverse effects to the floodplain would be long term (i.e., building new facilities within the floodplain of the Merced River could alter water recharge rates or floodwater dissipation, or increase flood hazard on structures or individuals). Potential adverse impacts on hydrology and hydrologic processes could result from streambank stabilization (e.g., riprap) or channel modifications (e.g., rerouting the flow of the Merced River). These adverse effects to hydrology, floodplains, and water quality would be reduced to no impact or to a negligible to minor intensity by application of the criteria and considerations (including the Section 7 determination process), mitigation measures described in Chapter II (e.g., siting to avoid effects to floodplains, best management practices, oil and sediment separators), implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*, and implementation of VERP management actions.

Repair or redevelopment of existing facilities (e.g., El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts of the proposed design on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values could include direct and permanent alteration of the floodplain, installation of fill or riprap within the Merced River, erosion and the long-term discharge of pollutants associated with use of the road (e.g., oil, grease, litter). These types of impacts would be long term, moderate to major, and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, Clean Water Act). Through these processes, project designs that avoid and minimize adverse effects to the Outstandingly Remarkable Values

(including hydrologic processes) and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress, in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease, because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible intensity.

The application of management elements under this alternative would increase protection and enhancement of hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities within the floodplain of the Merced River that could have short- and long-term negative effects on hydrology, floodplains, and water quality. These impacts could be reduced to a negligible to minor intensity through the application of mitigation measures described in Chapter II, the criteria and considerations (including the Section 7 determination), and implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*.

Impacts in Wawona. Excellent water quality is listed as a hydrologic-process Outstandingly Remarkable Value of the impoundment above Wawona. No specific hydrologic-process Outstandingly Remarkable Values are listed for Wawona. The majority of Wawona would be zoned consistent with current visitor use and facilities. Portions of facilities within the River Protection Overlay and floodplain of the South Fork, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. Such removal would allow natural hydrologic processes to prevail at these locations, restore developed zones to natural floodplain, and reduce sources of water pollutants, thereby resulting in a long-term, minor, beneficial impact.

An example of an obstruction removal would be the replacement of Wawona Bridge. Design and construction of the bridge would have to conform to criteria to protect and enhance the Outstandingly Remarkable Values of the river, pursuant to Section 7 of the Wild and Scenic Rivers Act (see Chapter II, Site-Specific Elements Common to All Action Alternatives). Removal of the bridge would eliminate in-channel obstructions (bridge pilings) and channel constrictions (bank armament at the bridge abutments). Under Alternative 4, the River Protection Overlay would not allow further degradation of river conditions and would provide for enhancement of the free-flowing condition wherever possible in design and construction of the new bridge. This bridge could be replaced under the River Protection Overlay as an essential park facility, and the adjacent 2B zone would allow for primary roadways leading to the bridge crossing.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term, negligible to minor, adverse effects to water quality (e.g., pollutants associated with construction/demolition) could occur if facilities were removed from the River Protection Overlay. These adverse impacts could

be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 4 would have a long-term, negligible to minor, beneficial impact on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative

Summary of Alternative 4 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that have potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on flood hazards, hydrologic and geomorphic processes, and related Outstandingly Remarkable Values within the river corridor because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could alter floodplain characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay), in combination with the application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), would allow the hydrologic and geomorphic processes to remain relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, moderate, beneficial impact on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to hydrology discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect the watershed of the Merced River.

Past Actions. The Merced River has been historically affected by a variety of projects that have introduced obstructions into the river channel, modified the floodplain, and adversely affected water quality. Alterations to hydrology have occurred through development and use within the Merced River corridor since Euro-American settlement. Examples of projects that have had adverse effects on the hydrologic processes of the Merced River include bridges, riprap, removal of large woody debris, dikes, flood walls, impoundments, dams, and buildings.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem

and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects the water quality of the Merced River immediately adjacent to the roadway. The free-flowing condition of the Merced River has been adversely altered by direct placement of fill and riprap to widen and stabilize the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and by excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall short-term effects on water quality.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; (3) projects anticipated to have a net adverse effect; and (4) projects that would not affect the hydrological processes of the Merced River.

Examples of projects that could have a cumulative, beneficial effect on hydrological processes in the Merced River include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- South Fork Merced River Bridges Replacement (NPS)

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects on water quality), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, the net cumulative effect of these projects would be a long-term, beneficial impact on hydrological processes of the Merced River.

A reasonably foreseeable project that could have mixed adverse and beneficial effects on hydrological processes includes:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* has the potential to positively affect free flow of the Merced River by the proposed removal of the Cascades Diversion Dam. The *Yosemite Valley Plan* also has the potential to adversely affect water quality during construction activities related to Segment D of the El Portal Road Reconstruction Project (short-term), with the long-term, beneficial effect of improving water quality. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., effects to water quality). Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

However, some of the proposed redevelopment in El Portal (e.g., redevelopment of the sand pit), would be inconsistent with the management zoning in this alternative. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on hydrological processes include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Yosemite Motels, El Portal (Mariposa Co.)

Cumulative effects of these potential future projects on the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development which could result in streambank erosion, soil compaction, loss of

vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term, minor, and beneficial.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that have potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on flood hazards, hydrologic and geomorphic processes, and related Outstandingly Remarkable Values within the river corridor because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects on hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could alter floodplain characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones in east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow the hydrologic and geomorphic processes to remain relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, moderate, beneficial impact on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

In total, the net effect of past, present, and reasonably foreseeable actions could have a long-term, minor, beneficial effect on hydrological processes in the Merced River watershed because the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term, minor, and beneficial.

Wetlands

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wetland resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 4.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wetland-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wetland and aquatic habitats). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-

related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are wetland-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Upper River and Lower River Campgrounds) that have the potential to adversely affect native wetland and aquatic habitats. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive wetland habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of these wetland habitats resulting in a site-specific, long-term, minor, beneficial impact.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., an upland location more resistant to impacts). This could increase opportunities for revegetation and restoration of natural wetland and aquatic habitats, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the

River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native wetland and aquatic habitats is correlated to the amount of facility removal and/or restoration. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside vegetation in Yosemite Valley, an Outstandingly Remarkable Value.

- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, including wetland and aquatic resources. The 2A and 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative:
 - Several facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
 - Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions.
 - Visitor access to the Merced River could be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected.
 - Large areas of sensitive habitats such as El Capitan Meadow would be zoned 2A and receive increased protection over current conditions.

If the above actions occur due to the 2A and 2B zoning, increased opportunities could exist for revegetation and restoration of wetland and aquatic resources (a biological resource Outstandingly Remarkable Value). Additional benefits to wetland and aquatic resources could include reduced trampling, erosion, and compaction; reduced potential for introduction or spread of non-native species, reduced nonpoint-source pollutants; and reduced refuse. This could result in major, long-term, beneficial effects to wetland and aquatic resources. Incompatible facilities could be relocated elsewhere in the park or removed from the park altogether. Relocation of facilities to other locations within the park would have site-specific, long-term, negligible to major, adverse effects on wetland and aquatic resources, depending on site-specific conditions and project design. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures similar to those described in Chapter II (e.g., siting to avoid effects to sensitive habitats, compensation, best management practices, visitor education).

- A transit center and day-visitor parking facility would be precluded within the 2A and 2B zones in Yosemite Valley, and it is unlikely that adequate day-visitor parking areas could be established outside of the quarter-mile boundary to accommodate current or anticipated visitor demand. This could result in a significant reduction in the number of visitors to Yosemite Valley compared with existing conditions. As a result, many day visitors could be displaced to other parts of the park (e.g., Wawona, Tuolumne Meadows) or could be excluded from the park altogether. Increased visitor use of areas outside of Yosemite Valley could have negligible to major, long-term, adverse effects depending on site-specific conditions and the level and type of use; however, reducing the number of visitors to Yosemite Valley could have major, long-term, beneficial effects to wetland and aquatic resources throughout Yosemite Valley by reducing visitor-induced impacts, such as

trampling, erosion, compaction, refuse, nonpoint-source pollutants, and introduction and spread of non-native species.

Examples of how management elements proposed under this alternative could have negative effects on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on wetlands, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse affects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on wetlands, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas would affect wetland resources at the site and increase erosion and sedimentation to the river. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be minor to negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Localized, minor, short-term, adverse, temporary effects on native wetland and aquatic habitats could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native wetland and aquatic habitats. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to native wetland and aquatic habitats to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 4 would provide increased protection for native wetland and aquatic habitats and wetland-related

Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wetland-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+ and 2B and receive increased protection over the absence of zoning under the No Action Alternative. El Portal Trailer Village would be zoned 2B and could be removed as a result. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 4 would affect native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- The majority of the gorge is relatively inaccessible and visitor use is unlikely to change. Consequently, there would be no impact on wetland and aquatic habitats or wetland-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., radiating impacts from development), minor to moderate, adverse effects on native wetland and aquatic habitats. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts, long-term, minor to moderate, negative effects to native wetland and aquatic habitats (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss

of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wetland-related Outstandingly Remarkable Values, other vegetation resources (e.g., upland scrub or woodlands) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wetland-related Outstandingly Remarkable Values of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by visitors, and a nearly full range of riverine environments typical to the Sierra Nevada. The wilderness segments of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wetland and aquatic habitats) under a separate future planning action under the No Action Alternative. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations

within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Large portions of the South Fork would be zoned 1A, 1B, 2A+, and 2B and receive increased protection over the absence of zoning under the No Action Alternative. The zoning would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking that have the potential to adversely affect wetlands. Existing facilities (e.g., the Wawona Golf Course, Wawona Impoundment) would be zoned so that they could continue to function consistent with existing conditions. Portions of features adjacent to the South Fork, such as Wawona Campground and the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated, thereby increasing opportunities for revegetation and restoration of riparian habitat and resulting in moderate to major, site-specific, long-term, beneficial effects. Overall, the proposed zoning is not anticipated to alter use patterns of the South Fork compared to the No Action Alternative.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to wetland and aquatic habitats could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 4 would have a long-term negligible to minor beneficial impact on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 4 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wetland and aquatic habitats (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities,

road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, moderate to major, beneficial effects on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wetland and aquatic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wetland patterns (i.e., within the river corridor) as well as large-scale or regional wetland patterns.

Past Actions. Aquatic and riparian systems are the most altered and impaired habitats of the Sierra Nevada and are relatively rare in the context of the entire landscape. Wetlands in the Sierra Nevada have been drained since the earliest settlers attempted to “reclaim” meadows and other seasonally wet areas. Mountain meadows were commonly drained with the intent of improving forage conditions and to permit agriculture (Hughes 1934, as in NPS 1997b, University of California, Davis 1996). Development and activity in Yosemite National Park has reduced historic wet meadow acreage by 60-65%. Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, agriculture, buildings, campgrounds, and recreational features. Dams and diversions throughout most of the range have profoundly altered stream-flow patterns and water temperatures. Within the mountains, broad valleys with wide riparian areas were often reservoir sites, and much of the best former riparian habitat in the Sierra Nevada is now under water. The extent of the inundation across the range becomes apparent when one realizes that virtually all flatwater on the western slope of the Sierra Nevada below 5,000 feet is artificial (University of California, Davis 1996). These past actions have had long-term adverse effects on regional wetland and aquatic habitats.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wetlands of the Merced River

immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wetlands include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); the Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, and Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- South Fork Merced River Bridges Replacement (NPS)

Although each of these projects may have site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wetlands. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wetland resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example is the update to the *Yosemite Wilderness Management Plan*, which could result in the

removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wetlands include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term, beneficial impact to wetland resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature riparian vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional wetlands include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)

- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridges Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional growth. Each of the aforementioned projects has the potential to have site-specific, adverse effects on wetland and aquatic resources during construction (short-term) and by direct displacement of resources (long-term). Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to wetland and aquatic resources, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement.

Wetland and riparian systems of the Merced River and the Sierra Nevada have been substantially altered by development and visitor activities. These changes have negatively influenced wetland size, form, and function and the plants, wildlife, and aquatic species that inhabit them. Cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wetlands include wetland restoration, rehabilitation projects, and ecosystem management. Cumulative adverse effects would be related to past, present, and reasonably foreseeable increased facilities, regional growth, and visitor demand. Several of these cumulative actions could have a long-term, beneficial effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor. However, throughout the Sierra Nevada and larger region, regional development and growth could have a net long-term, adverse effect on regional wetland and aquatic resources that would not be compensated by local or regional planning and restoration projects. Therefore, cumulative adverse effects on regional wetland and aquatic habitats due to past, present, and reasonably foreseeable actions, could be major, adverse, and long term.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 4 could have a net long-term, major, adverse effect on regional wetland patterns.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wetland (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on wetland and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wetland could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate to major, beneficial impact on native wetland and wetland-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetland and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to have a long-term, major, adverse cumulative effect on regional wetland patterns. These cumulative actions in combination with Alternative 4 could have a long-term, major, adverse effect on regional wetland patterns.

Vegetation

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act, Clean Water Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to vegetation resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 4.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of vegetation-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation) under the No Action Alternative. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are vegetation-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect native vegetation. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance native vegetation and vegetation related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., an upland location more resistant to impacts). This could increase opportunities for revegetation and restoration of natural wetland and aquatic habitats, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the

River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native vegetation is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside vegetation in Yosemite Valley, an Outstandingly Remarkable Value.

- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, including vegetation resources. The 2A and 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative:
 - Several facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
 - Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions.
 - Visitor access to the Merced River could be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected.
 - Large areas of sensitive habitats such as El Capitan Meadow would be zoned 2A and receive increased protection over current conditions.

If the above actions occur due to the 2A and 2B zoning, increased opportunities could exist for revegetation and restoration of wetland and aquatic resources (a biological resource Outstandingly Remarkable Value). Additional benefits to vegetation resources could include reduced trampling, erosion, and compaction; reduced potential for introduction or spread of non-native species, reduced nonpoint-source pollutants; and reduced refuse. This could result in major, long-term, beneficial effects to vegetation resources. Incompatible facilities could be relocated elsewhere in the park or removed from the park altogether. Relocation of facilities to other locations within the park would have site-specific, long-term, negligible to major, adverse effects on vegetation resources, depending on site-specific conditions and project design. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures similar to those described in Chapter II (e.g., siting to avoid effects to sensitive habitats, compensation, best management practices, visitor education).

- A transit center and day-visitor parking facility would be precluded within the 2A and 2B zones in Yosemite Valley, and it is unlikely that adequate day-visitor parking areas could be established outside of the quarter-mile boundary to accommodate current or anticipated visitor demand. This could result in a significant reduction in the number of visitors to Yosemite Valley compared with existing conditions. As a result, many day visitors could be displaced to other parts of the park (e.g., Wawona, Tuolumne Meadows) or could be excluded from the park altogether. Increased visitor use of areas outside of Yosemite Valley could have negligible to major, long-term, adverse effects depending on site-specific conditions and the level and type of use; however, reducing the number of visitors to Yosemite Valley could have major, long-term, beneficial effects to vegetation resources throughout Yosemite Valley by reducing visitor-induced impacts, such as trampling, erosion,

compaction, refuse, nonpoint-source pollutants, and introduction and spread of non-native species.

Examples of how management elements proposed under this alternative could have negative effects on native vegetation and vegetation related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse affects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas would affect wetland resources at the site and increase erosion and sedimentation to the river. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be minor to negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Localized, minor, short-term, temporary effects on native vegetation could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native vegetation. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to native vegetation to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 4 would provide increased protection for native vegetation and vegetation-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of vegetation-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+ and 2B and receive increased protection over the absence of zoning under the No Action Alternative. El Portal Trailer Village would be zoned 2B and could be removed as a result. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 4 would affect native vegetation and vegetation-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flow condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- The majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on vegetation or vegetation-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., fire suppression in the vicinity of structures), minor to moderate, adverse effects on native vegetation. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to native vegetation (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native vegetation and vegetation-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the

proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of vegetation and vegetation-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect vegetation-related Outstandingly Remarkable Values, other vegetation resources (e.g., upland scrub or woodlands) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of vegetation-related Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by humans, and a nearly full range of riverine environments typical to the Sierra Nevada. The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Large portions of the South Fork would be zoned 1A, 1B, 2A+, and 2B and receive increased protection over the absence of zoning under the No Action Alternative. The zoning would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking that have the potential to adversely affect wetlands. Existing facilities (e.g., the Wawona Golf Course, Wawona Impoundment) would be zoned so that they could continue to function consistent with existing conditions. Portions of features adjacent to the South Fork, such as Wawona Campground and the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated, thereby increasing opportunities for revegetation and restoration of riparian habitat and resulting in moderate to major, site-specific, long-term, beneficial effects. Overall, the proposed zoning is not anticipated to alter use patterns of the South Fork compared to the No Action Alternative.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to vegetation could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 4 would have a long-term negligible to minor beneficial impact on native vegetation and vegetation-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 4 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively

unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, moderate to major, beneficial effects on vegetation and vegetation-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to vegetation discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local vegetation patterns (i.e., within the river corridor) as well as large-scale or regional vegetation patterns.

Past Actions. In general, vegetation patterns of the Sierra Nevada are relatively intact compared to other areas of California. Regional vegetation has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Portions of the Merced River and South Fork corridors within Yosemite National Park are relatively natural, especially in wilderness areas where use has had little effect on vegetation. Development and use of infrastructure within Yosemite Valley and throughout the Sierra Nevada have caused long-term, adverse alterations to native vegetation patterns since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects vegetation of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional vegetation include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native vegetation. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional vegetation include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect vegetation resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to vegetation resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional vegetation include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road

Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)

- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on vegetation resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native vegetation patterns. Regional population growth primarily affects regional vegetation patterns through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to vegetation, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, major, adverse effect on regional vegetation resources that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 4 could have a net long-term, major, adverse effect on regional vegetation patterns.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new

actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate to major, beneficial impact on native vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 4 could have a long-term, major, adverse effect on regional vegetation patterns.

Wildlife

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wildlife resources that could occur within each segment of the Merced River corridor from application of management elements in Alternative 4.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wildlife-related Outstandingly Remarkable Values of the upper Merced River include riverine wildlife habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special-status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wildlife). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Yosemite Valley. Riparian areas and low-elevation meadows are the most productive communities in Yosemite Valley. The high quality and large extent of riparian, wetland, and other riverine areas provide rich habitat for a diversity of river-related species, including special-status species, neotropical migrant songbirds, and numerous bat species. These are examples of wildlife-related Outstandingly Remarkable Values within Yosemite Valley.

Yosemite Valley would be zoned to protect natural resources. Although portions of the east Valley would remain developed, the proposed zoning and River Protection Overlay (overall) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Cathedral Beach) that have the potential to adversely affect native wildlife. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the

consistent set of criteria and considerations within would have a short- and long-term, minor, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance (i.e., beneficial effect) native wildlife and wildlife-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for species likely to occur there, such as California newt and western aquatic garter snake, and would increase protection of potential California red-legged frog habitat (a wildlife-related Outstandingly Remarkable Value).
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., to an upland location lacking high value resources that is more resistant to adverse impacts). This could increase opportunities for revegetation and restoration of natural vegetation and wildlife habitat, resulting in a minor to moderate, site-specific, long-term, beneficial effect to the wildlife habitat of El Capitan Meadow.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. The magnitude of the effect of the River Protection Overlay on native wildlife is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a minor to major, long-term, beneficial effect on streamside wildlife in Yosemite Valley, an Outstandingly Remarkable Value.
- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would provide greater protection of natural resources and opportunities for restoration and enhancement of wildlife habitats. The 2A and 2B zoning would promote river restoration and shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented

activities. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative.

- Several existing facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed
- Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions
- Visitor access to the Merced River would be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected
- Large areas of sensitive wetland and aquatic habitats such as El Capitan Meadow, Wosky Pond, and Bridalveil Bog would be zoned 2A and would receive increased protection over current conditions

If these actions were to occur under the 2A and 2B zoning, opportunities could increase for revegetation and restoration of wildlife, particularly riparian wildlife habitats (a biological resource Outstandingly Remarkable Value). These actions could also reduce trampling, erosion, and compaction; reduce the potential for introduction or spread of non-native species such as the bullfrog, or parasitic species such as the cowbird; reduce nonpoint-source pollutants; and reduce refuse. In addition, there would be a moderate, beneficial impact on the maintenance of connectivity between the various habitat types in the Merced River corridor. There would be a minor, beneficial impact in aquatic habitat structural elements, such as snags and down-and-dead and woody material in streams, as these would not be routinely removed for the safety of users of non-motorized watercraft, as had been the case previously.

- A transit center and day-visitor parking facility would be precluded within the 2A and 2B zones in Yosemite Valley, and it is unlikely that adequate day-visitor parking areas could be established outside of the quarter-mile boundary to accommodate anticipated visitor demand. This could result in a significant reduction in the number of visitors to Yosemite Valley compared with existing conditions. As a result, many day visitors could be displaced to other parts of the park (e.g., Wawona, Tuolumne Meadows) or could be excluded from the park altogether. Increased visitor use of areas outside of Yosemite Valley could have negligible to major, long-term, adverse effects on local wildlife, depending on site-specific conditions and the level and type of use. For example, human/mountain lion encounters are more common when visitors disperse into little-used areas (Beier 1991), and the ameliorating effects of habituation, whereby animals grow accustomed to passersby on an established trail, are lost whenever hikers depart from the trail or the trail is removed (MacArthur et al. 1982; Knight and Gutzwiller 1995; Geist 1978; all cited in Knight and Gutzwiller 1995). However, the general result of reducing the number of visitors to Yosemite Valley is a major, long-term, beneficial effect to wildlife.

Examples of how management elements proposed under this alternative could have negative effects on native wildlife and wildlife related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of

these areas would increase erosion and sedimentation to the river and its tributaries. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal regulations (e.g., the federal Endangered Species Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor to major, short-term, temporary effects on wildlife could occur from construction (e.g., new parking facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, noise, and introduction and spread of non-native species. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. The application of mitigation measures (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could lessen the potential for impacts to wildlife habitats (described in Chapter II). Implementation of such measures could reduce the potential adverse impacts to a negligible to moderate intensity.

Although site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 4 would provide increased protection for native wildlife and wildlife-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wildlife-related Outstandingly Remarkable Values of the Merced River gorge include diverse riparian areas that are largely undisturbed by humans and river-associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2A, and 2B. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 4 would affect wildlife and wildlife-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced

River to a more natural condition thereby enhancing the biological integrity of this segment and fish habitat. This could increase opportunities for revegetation and restoration of riparian habitats, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value.

- The majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on wildlife or wildlife-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with riverine habitat and natural regeneration of riparian habitat at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed, which would allow for natural processes to prevail at this location, enhance the aquatic habitat (e.g., the removal of sources of pollutants would improve water quality and increase habitat values) and allow natural revegetation with riparian species. This could result in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, human presence, fire suppression in the vicinity of structures), minor to major, adverse effects on native wildlife. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, shielded lighting, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts to long-term, minor to moderate, negative effects to native wildlife (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired

conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wildlife and wildlife-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wildlife-related Outstandingly Remarkable Values, other wildlife resources, such as upland wildlife species (e.g., bears, deer) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wildlife-related Outstandingly Remarkable Values of wilderness segments of the South Fork include a nearly full range of riverine environments typical to the Sierra Nevada that are largely intact and undisturbed by humans. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog.

The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflect current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wildlife), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, they would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian habitat based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Wawona. Examples of wildlife-related Outstandingly Remarkable Values of Wawona includes diverse riparian areas that are intact and largely undisturbed by humans. River-related federal and state special-status species in this segment include Wawona riffle beetle.

The South Fork in Wawona would have a base zone of 2B. The 2B zone would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day visitor parking that have the potential to adversely affect hydrology, floodplains, and water quality. Portions of facilities within the River Protection Overlay, such as portions of Wawona Campground and a portion of the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated. This could increase opportunities for natural revegetation and restoration of riparian habitat, resulting in a long-term, minor, beneficial impact on streamside vegetation, a biological resource Outstandingly Remarkable Value.

An example of an obstruction removal could be the replacement of Wawona Bridge. Design and construction of the bridge would have to conform to criteria to protect and enhance the Outstandingly Remarkable Values of the river pursuant to Section 7 of the Wild and Scenic Rivers Act (see Chapter II, Site-Specific Elements Common to the Action Alternatives). Removal of the existing bridge would eliminate in-channel obstructions (bridge pilings) and channel constrictions (bank armament at the bridge abutments). Under Alternative 4, the River Protection Overlay would not allow further degradation of river conditions and would petition for enhancement of the free-flowing conditions (a beneficial impact on the aquatic habitat) wherever possible in design and construction of the new bridge. This bridge could be replaced under the River Protection Overlay as an essential park facility, and the adjacent 2B zone would allow for primary roadways leading to the bridge crossing.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to wildlife could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 4 would have a long-term negligible to minor beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 4 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that have the potential to adversely affect native wildlife (a minor, beneficial impact). Extending the 2A and 2B zones over a quarter-mile boundary within Yosemite Valley could preclude a transit center and day-visitor parking facility and could result in a significant reduction in the number of visitors to Yosemite Valley compared with existing conditions. As a result, many day visitors could be displaced to other parts of the park (e.g., Wawona, Tuolumne Meadows) or could be excluded from the park altogether. Although increased visitor use of areas outside of Yosemite Valley could have adverse effects (negligible to major and long-term, depending on-site specific conditions and the level and type of use), reducing the number of visitors to Yosemite Valley could have major, long-term, beneficial effects to wildlife throughout Yosemite Valley by reducing human-induced impacts. In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor because these elements could

preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed Zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate to major, beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wildlife patterns (i.e., within the river corridor) as well as large-scale or regional wildlife patterns.

Past Actions. Wildlife communities have been manipulated almost since the beginning of the park. Regional wildlife has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Fur-bearing mammals were trapped by park rangers until 1925; lions were considered dangerous predators and controlled through the 1920s; bears were artificially fed as a tourist attraction until 1940. Natural wildfires, with their generally beneficial effects on wildlife habitat, were routinely suppressed until 1972 (Wuerthner 1994). Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

Yosemite's largest mammal, the grizzly bear, was extirpated from the region and from the state in the 1920s. Other mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by human activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including Yosemite National Park. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes.

Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in

Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Most fish currently found in the Merced River and its tributaries in Yosemite National Park have been introduced. Prior to trout stocking for sport fishing, native fish in Yosemite were probably limited to the rainbow trout and the Sacramento sucker, both of which were present only in the lower portions of the Merced River (i.e., Yosemite Valley and below). Rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or has displaced, the original strain.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wildlife of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wildlife include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration

- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wildlife. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wildlife include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco),
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wildlife resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to wildlife resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary

construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) wildlife, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Components of the *Yosemite Valley Plan* would need to change to conform with this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional wildlife include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population

and regional growth and their subsequent effect on natural resources, including native wildlife patterns. Regional population growth primarily affects regional wildlife patterns through construction (e.g., new housing and infrastructure) and human use. Examples of construction- and human-use-related effects on wildlife patterns include direct displacement of wildlife (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). More importantly, some of the projects provide for increased residential growth adjacent to the park and would accommodate increased recreational development. In total, regional development and growth could have a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. For the species at higher elevations, the effects are somewhat mitigated by resource protection planning and restoration. Although each new development is required to mitigate or compensate for adverse effects to wildlife, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate, adverse effect on regional wildlife resources that would not be compensated by regional planning and restoration projects discussed above.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be moderate, adverse, and long term.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect native wildlife (a minor, beneficial impact). Extending the 2A and 2B zones over a quarter-mile boundary within Yosemite Valley could preclude a transit center and day-visitor parking facility and could result in a significant reduction in the number of visitors to Yosemite Valley compared with existing conditions. As a result, many day visitors could be displaced to other parts of the park (e.g., Wawona, Tuolumne Meadows) or could be excluded from the park altogether. Although increased visitor use of areas outside of Yosemite Valley could have adverse effects (negligible to major and long-term, depending on-site specific conditions and the level and type of use), reducing the number of visitors to Yosemite Valley could have major, long-term, beneficial effects to wildlife throughout Yosemite Valley by reducing human-induced impacts. In the long-term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate,

beneficial, effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate to major, beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No-Action Alternative.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions would be moderate, adverse, and long term.

Rare, Threatened, and Endangered Species

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to rare, threatened, and endangered species that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 4.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of biological resource Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, or endangered species). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, or endangered species and related Outstandingly Remarkable Values of the upper wilderness segment of the main stem Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows, a habitat for rare, threatened, or endangered species, based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are biological resource Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values while providing a diverse visitor experience. Although portions of the east Valley would remain developed, the proposed zoning (including the River Protection Overlay) of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect rare, threatened, or endangered species. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the River Protection Overlay, the VERP framework, and the criteria and considerations would protect and enhance rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for special status-species likely to use wet meadows for foraging, such as western mastiff bat.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2A zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2A zoning. Under the 2A zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed elsewhere (e.g., an upland location more resistant to impacts). This could increase opportunities for revegetation and restoration of habitat for rare, threatened and endangered species, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow and a variety special-status species which are also Outstandingly Remarkable Values, such as great gray owl, foothill yellow-legged frog, and numerous bat species.
- Several existing facilities immediately adjacent to the Merced River would be inconsistent with the River Protection Overlay and could be removed (e.g., portions of Housekeeping Camp, several bridges, portions of Lower Pines Campground). Removal of facilities from the River Protection Overlay in combination would remove sources of pollutants (e.g., oil), reduce trampling, compaction, and soil erosion (associated with facility use and maintenance), and increase opportunities for revegetation and restoration of riparian vegetation. Removal of obstructions may lead to seasonal creation of back-channel pools (a habitat niche now largely unavailable), which could improve conditions for native amphibians currently absent from the park, such as California red-legged frog. The magnitude of the effect of the River Protection Overlay on rare, threatened, and endangered species is correlated to degree to which it is implemented in the future. For example, removal of one bridge would likely have only a negligible, beneficial effect where as removal of several facilities would have a moderate to major, long-term, beneficial effect on streamside habitats for river-associated rare, threatened, or endangered species in Yosemite Valley, an Outstandingly Remarkable Value.
- The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, including habitat for rare, threatened, or endangered species. The 2A and 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. The following actions

and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative:

- Several facilities (e.g., Housekeeping Camp, portions of North Pines and Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
- Developed launch and removal sites for non-motorized watercraft could be reduced compared with existing conditions.
- Visitor access to the Merced River could be directed to specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C), and could be managed to minimize effects on sensitive areas within the corridor that are currently unprotected.
- Large areas of sensitive habitats such as El Capitan Meadow would be zoned 2A and receive increased protection over current conditions.

If the above actions occur due to the 2A and 2B zoning, increased opportunities could exist for revegetation and restoration of habitat for rare, threatened, or endangered species. Additional benefits to rare, threatened, or endangered species could include reduced trampling, erosion, and compaction; reduced potential for introduction or spread of non-native species, reduced nonpoint-source pollutants; and reduced refuse. This could result in major, long-term, beneficial effects to rare, threatened, or endangered species. Incompatible facilities could be relocated elsewhere in the park or removed from the park altogether. Relocation of facilities to other locations within the park would have site-specific, long-term, negligible to major, adverse effects on rare, threatened, or endangered species, depending on site-specific conditions and project design. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures similar to those described in Chapter II (e.g., siting to avoid effects to sensitive habitats, compensation, best management practices, visitor education).

- A transit center and day-visitor parking facility would be precluded within the 2A and 2B zones in Yosemite Valley, and it is unlikely that adequate day-visitor parking areas could be established outside of the quarter-mile boundary to accommodate current or anticipated visitor demand. This could result in a significant reduction in the number of visitors to Yosemite Valley compared with existing conditions. As a result, many day visitors could be displaced to other parts of the park (e.g., Wawona, Tuolumne Meadows) or could be excluded from the park altogether. Increased visitor use of areas outside of Yosemite Valley could have negligible to major, long-term, adverse effects depending on site-specific conditions and the level and type of use; however, reducing the number of visitors to Yosemite Valley could have major, long-term, beneficial effects to special-status species throughout Yosemite Valley by reducing visitor-induced impacts, such as trampling, erosion, compaction, refuse, nonpoint-source pollutants, and introduction and spread of non-native species.

Examples of how management elements proposed under this alternative could have negative effects on rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., federal Endangered Species Act).

- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Development of a transit center and/or day-visitor parking facility at Camp 6 in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then visitors unable to find an authorized place to park would circle the Valley (increasing road-associated pollutants) or could decide to park in unauthorized/improper areas. Disturbance of these areas would affect resources at the site (including potential habitat for special-status species) and increase erosion and sedimentation to the river. Illegal parking also could provide increased nonpoint-source pollutants from visitors and vehicles in areas where stormwater runoff could easily transport such pollutants to the river or its tributaries. The intensity of this impact would be minor to negligible since it is assumed that fewer visitors would be present in the developed areas along the river. This potential negligible, adverse impact would be short-term in duration due to implementation of the VERP framework, which would allow for the recognition of degraded conditions due to visitor use.
- Localized, minor, short-term, temporary effects on special-status species could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native habitats. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. Bridge removal could also adversely affect roosting bats (if present). The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to special-status species to a negligible intensity.

Although site-specific, short- and long-term, negative effects to rare, threatened, or endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 4 would provide increased protection for rare, threatened, or endangered species and related Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+ and 2B and receive increased protection over the absence of zoning under the No Action Alternative. El Portal Trailer Village would be zoned 2B and could be removed as a result. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 4

would affect native rare, threatened, and endangered species and related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Existing facilities, such as the Cascades Diversion Dam, would be inconsistent with the River Protection Overlay and could be removed. Potential removal of this and other facilities would increase the free-flowing condition of the Merced River and return this portion of the Merced River to a more natural condition thereby enhancing the biological integrity of this segment. This could increase opportunities for revegetation and restoration of riparian vegetation, resulting in moderate, site-specific, long-term, beneficial effects on this Outstandingly Remarkable Value. Removal of obstructions may lead to seasonal creation of back-channel pools (a habitat niche now largely unavailable), which could improve conditions for native amphibians currently absent from the park, such as California red-legged frog. Minor, short-term, adverse effects could occur during facility removal and could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education).
- The majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on rare, threatened, and endangered species or related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation, such as blue elderberry—host plant for the Valley elderberry longhorn beetle. It may also adversely impact the recently identified population of Cogdon's wooly sunflower at this site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, noise, fire suppression in the vicinity of structures), minor to moderate, adverse effects rare, threatened, and endangered species. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to rare, threatened, and endangered species (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park

Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of rare, threatened, and endangered species and related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect river-related rare, threatened, and endangered species (Outstandingly Remarkable Values), other rare, threatened, and endangered species (e.g., upland rare, threatened, and endangered species) would be mitigated for during consultation with the U.S. Fish and Wildlife Service pursuant to the federal Endangered Species Act.

Impacts in Wilderness Segments of the South Fork. Examples of biological resource Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by humans, and a nearly full range of riverine environments typical to the Sierra Nevada. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog. The upper (above Wawona) and lower (below Wawona) portions of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, and endangered species), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments

would have a short- and long-term, negligible, beneficial effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, and endangered species and related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Large portions of the South Fork would be zoned 1A, 1B, 2A+, and 2B and receive increased protection over the absence of zoning under the No Action Alternative. The zoning would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking that have the potential to adversely affect native rare, threatened, and endangered species. Existing facilities (e.g., the Wawona Golf Course, Wawona Impoundment) would be zoned so that they could continue to function consistent with existing conditions. Portions of features adjacent to the South Fork, such as Wawona Campground and the Wawona maintenance facility, would be inconsistent with the River Protection Overlay and could be removed or relocated, thereby increasing opportunities for revegetation and restoration of riparian habitat and resulting in moderate to major, site-specific, long-term, beneficial effects to related native rare, threatened, and endangered species. Overall, the proposed zoning is not anticipated to alter use patterns of the South Fork compared to the No Action Alternative.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to native rare, threatened, and endangered species could occur if facilities are removed from the River Protection Overlay. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 4 would have a long-term negligible to minor beneficial impact on native rare, threatened, and endangered species and related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 4 Impacts. For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of

future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate to major, beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to rare, threatened, and endangered species discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region. The intensity of impact depends on whether the impacts are anticipated to interact cumulatively. For example, factors external to the park, such as broad regional habitat degradation and pesticide use, can combine with existing, in-park impacts, such as non-native species, to cause declines in rare, threatened, or endangered amphibians (e.g., mountain yellow-legged frog and Yosemite toad), an adverse, cumulative impact. The projects identified below include those projects that have the potential to effect populations of rare, threatened, or endangered species (i.e., within the river corridor) as well as large-scale or regional populations of the same species.

Past Actions. Natural habitats have been manipulated almost since the beginning of the park. Regional wildlife and vegetation patterns have been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by visitor activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Past and ongoing activities that affect rare, threatened, or endangered species include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem

and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects habitats immediately adjacent to the roadway. Special-status species with potential to be affected during construction include Valley elderberry longhorn beetle, roosting bats, peregrine falcon, and Tompkin's sedge. Special-status roosting bats could be affected, primarily through the noise generated by construction equipment and blasting. Blasting is also a concern for the peregrine falcon, known to occur at the Cascades aerie in the project vicinity (the peregrine was recently delisted but continues to be a species of concern in the park). Adverse effects to these species are avoided or minimized during construction by implementation of a compliance monitoring program, pre-construction surveys, erosion and sediment controls, minimizing noise during sensitive biological periods, construction timing restrictions, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional rare, threatened, or endangered species include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park

- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional rare, threatened, or endangered species. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional rare, threatened, and endangered species include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect rare, threatened, and endangered species during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to rare, threatened, and endangered species by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated

with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional rare, threatened, and endangered species include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on rare, threatened, and endangered species during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including rare, threatened, and endangered species. Regional population growth primarily affects regional rare, threatened, and endangered species through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on rare,

threatened, and endangered species include direct displacement of rare, threatened, and endangered species (e.g., nest trees removed and replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., the spread of yellow star thistle by construction equipment and its subsequent adverse impacts on special status plant species), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to rare, threatened, and endangered species, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate to major (depending on species-specific impacts), adverse effect on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have long-term, moderate to major (depending on species-specific impacts), adverse cumulative impacts on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above. These cumulative actions in combination with Alternative 4 could have a net long-term, major, adverse effect on regional rare, threatened, and endangered species.

Conclusions

For the duration of this plan, management zoning and the River Protection Overlay would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats.

This would result in a long-term, moderate to major, beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional rare, threatened, and endangered species (e.g., introduction and spread of non-native species, direct displacement of habitat by structures). These cumulative actions in combination with Alternative 4 could have a long-term, major, adverse effect on regional rare, threatened, and endangered species.

Air Quality

Analysis

General Impacts. As a general matter, under Alternative 4, air quality in the corridor would continue to be influenced by local sources within the park and by regional sources upwind of the park. The differences between air quality conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 4, “air quality” would be eliminated as an Outstandingly Remarkable Value along all river segments; construction or demolition activities could be more frequent and extensive; and the number of campsites and day-visitor parking spaces could be reduced; and the number of visitors to the Valley would likely be lower than under Alternative 1.

Under Alternative 4, air quality would be removed from the list of Outstandingly Remarkable Values along all segments of the main stem of the Merced River and the South Fork within the park. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Air quality has been removed as an Outstandingly Remarkable Value because it is not river-related nor is it unique in the region or nation. However, the removal would not affect air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value. Emissions sources in the park would continue to be regulated pursuant to applicable provisions of the federal Clean Air Act, local air district *Rules and Regulations*, park campfire regulations, the *Fire Management Plan*, and state and federal motor-vehicle emissions control programs.

Under this alternative, some limited facilities could be constructed and other facilities removed based on the new management zoning designations. Potential construction or demolition activities could generate substantial amounts of dust (including PM-10 and PM-2.5), primarily from “fugitive” sources (i.e., emissions released through means other than through a stack or tailpipe), and lesser amounts of other criteria air pollutants, primarily from operation of heavy equipment. Dust emissions would vary from day to day, depending on the level and type of activity, silt

content of the soil, and the weather. In the absence of mitigation, construction activities could result in significant quantities of dust, and, as a result, local visibility and PM-10/PM-2.5 concentrations could be adversely affected. Without mitigation, dust raised by construction or demolition activities would have a major but temporary effect in the immediate vicinity of individual sites.

Best management practices are available to reduce construction- and demolition-related air quality impacts and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. Generally, these practices include watering active construction areas; covering trucks hauling materials that could spill onto paved surfaces; sweeping (with water sweepers) paved areas that are subject to vehicle traffic and on which soil materials have been deposited; stabilizing inactive construction areas; covering stockpiles; limiting vehicle speeds on unpaved areas; installing erosion control measures; and timely revegetation. All of these measures would not apply at each construction or demolition site. Generally, larger, more intensive construction or demolition projects require more comprehensive dust abatement programs than smaller, less intensive projects. Implementation of the best management practices would reduce the temporary and localized air quality impacts from construction or demolition activities to a minor level.

Under Alternative 4, the number of campsites and day-visitor parking spaces could be reduced relative to Alternative 1, because some of these facilities would be located in areas in which they would be inconsistent with the new zone designations. The reduction in the number of campsites would have a local, minor, long-term, beneficial effect by reducing the number of campfires and related emissions within the Valley and in Wawona on the typically busy days when the campgrounds would be full. The reduction in the number of day-visitor parking spaces would result in a local, minor, long-term, adverse effect on air quality in the Valley, due to increased vehicular congestion from visitors searching for remaining parking spaces or parking in nondesignated areas. Such congestion would lead to a minor, adverse impact due to the localized concentration of vehicular emissions. Under this alternative, the management zones would essentially preclude development of replacement parking spaces or a centralized parking facility with expanded shuttle service in the Valley.

Under Alternative 4, the potential reduction in the number of facilities for visitors within the Valley would likely reduce the number of visitors to the Valley itself. Some visitors would proceed to other areas of the park, such as Wawona and Tuolumne Meadows, while others would simply forego a trip to the park. On balance, fewer visitors would have a moderate, long-term, beneficial effect within the Valley due to reduced vehicular activity and a negligible, long-term, beneficial effect on regional air quality as a whole.

Summary of Alternative 4 Impacts. Under Alternative 4, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value, and since emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with site-specific construction or demolition activities within the

corridor. Over the long term under this alternative, the number of campsites could be reduced, which would result in a local, minor, beneficial effect by reducing the number of campfires and related emissions within the Valley and in Wawona on the typically busy days when the campgrounds would be full. Also, over the long term, the number of day-visitor parking spaces could be reduced, which could result in a local, minor, adverse effect due to increased vehicular congestion (and related emissions) from visitors searching for remaining parking spaces or parking in nondesignated areas. Lastly, under Alternative 4, the potential reduction in the number of facilities for visitors within the Valley would likely reduce the number of visitors to the Valley itself, which would result in a moderate, long-term, beneficial effect within the Valley due to reduced vehicular activity and a negligible, long-term, beneficial effect on regional air quality as a whole.

Cumulative Impacts

Cumulative effects to air quality discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect air quality within the river corridor or that could be affected by air pollutant sources within the river corridor.

Past Actions. Since 1950, the population of California has tripled, and the rate of increase in vehicle-miles-traveled has increased six-fold. Air quality conditions within the park have been influenced by this surge in population growth and its associated emissions from related industrial, commercial, and vehicular sources in upwind areas as tempered by a burgeoning regulatory apparatus. Since the 1970s, emissions sources operating within the park, as well as California as a whole, have been subject to local stationary-source controls and state and federal mobile-source controls. With the passage of time, such controls have been applied to an increasing number of sources, and the associated requirements have become dramatically more stringent and complex. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles and their related emissions until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The 1990 *Fire Management Plan* was developed to address management issues related to prescribed natural burns, prescribed burns, and wildfires in the park. Implementation of the smoke management policies of the 1990 *Fire Management Plan* reduces the potential for burns or wildfires to have a major effect on air quality in the park or in the park vicinity.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both negative (short-term during construction) and potentially beneficial (long-term) effects on air quality. Short-term, construction-related effects include dust and other pollutant emissions associated with operation of construction equipment, earthmoving activities, and vehicle travel over unpaved surfaces. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which could have a long-term, beneficial impact by reducing automobile trips.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects not anticipated to have a net adverse or beneficial, long-term effect.

Examples of projects that could have a cumulative, beneficial, long-term effect on air quality include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park.
- The San Joaquin Corridor Rail Projects (DOT, Amtrak) would contribute to a long-term, beneficial impact on air quality because such improvements would encourage travel by alternative (non-private vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resources Management Building (NPS) are two projects that would reduce work/home commutes for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. However, it is acknowledged that this consolidated parking facility at Yosemite Village is not compatible with the management zones of Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, these projects would have beneficial impact by reducing traffic congestion and related emissions in Yosemite Valley.
- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Reconstruction Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term, major, adverse impacts on local air quality primarily due to dust from construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle emissions.
- Several other regional projects that will have a net beneficial effect on air quality by improving the relative attractiveness of alternative modes of transportation and thereby

reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS) and the Expansion of Mariposa County Transit System (Mariposa Co.).

Although most of the aforementioned projects would have localized, short-term adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would have a beneficial, long-term effect on air quality.

Reasonably foreseeable future actions that could have an adverse effect on air quality include:

- Revisions to the 1990 *Yosemite Fire Management Plan* and development of the U.S. Forest Service's *Fire Management Action Plan for Wilderness*, which could lead to increased use of prescribed burning techniques
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects, the A-Rock Reforestation, the Fire Management Action Plan for Wilderness (USFS, Stanislaus National Forest), and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The Wawona Campground Improvement (NPS)
- Various development-related projects, such as the Mariposa County General Plan Update; Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); and the Buildout of City of Merced, General Plan
- The Highway 41 Extension (Madera Co.), which would not be a land use development project but would remove an obstacle to land use development (and associated emissions) in the fast-growing area north of Fresno

Revisions to the 1990 *Yosemite Fire Management Plan*, the development of the *Fire Management Action Plan for Wilderness* (USFS, Stanislaus), and the fuels and reforestation projects could lead to increased use of prescribed burning techniques and could have an intermittent, long-term, adverse effect on local and regional air quality and visibility, depending upon the extent to which these projects protect air resources. The Wawona Campground Improvement (NPS) would construct additional campsites, which could result in increased local emissions from campfires, unless the overall project (which would also involved rehabilitation of an existing campground) provides for group fire rings, rather than fire rings at each campsite.

Cumulative growth in the region, and the transportation projects, such as the Highway 41 Extension (Madera Co.) that support cumulative growth would have localized, short-term, construction-related impacts; over the long term, these projects would generate emissions of ozone precursors and particulate matter primarily due to associated motor vehicle trips.

Reasonably foreseeable future actions not anticipated to have a net adverse or beneficial effect on air quality, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); and South Fork Merced River Bridges Replacement (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration Project (NPS); update to the *Yosemite Wilderness Management Plan* (NPS); Tamarack Campground Rehabilitation (NPS); Bridalveil

Horse Camp Rehabilitation (NPS); Yosemite Creek Campground Rehabilitation (NPS); and the *South Fork and Merced Wild and Scenic River Implementation Plan* (USFS, BLM)

- Land exchanges, such as Yosemite View parcel land exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on air quality due to construction activities, and, in some cases, these effects would occur within the corridor. With respect to long-term effects, a distinction can be made between ozone and particulate matter. For ozone, regional emissions trends suggest that the combination of the beneficial effect of ongoing regional, state, and federal regulatory controls (particularly mobile source control programs) with the adverse effect of existing and future land use development and associated stationary, area, and mobile emissions sources, would result in a regional, moderate, beneficial effect. That is, the beneficial effect of past and present actions that regulate stationary and mobile emissions sources and reasonably foreseeable future actions that have the potential to reduce vehicle trips and vehicle-miles-traveled would offset the adverse effect of ozone precursor emissions associated with increased cumulative growth in the region, leading to a gradual improvement in ozone air quality.

For particulate matter, the net cumulative effect is more difficult to determine, since ambient concentrations of particulate matter reflect primary (i.e., directly emitted) particles as well as secondary (i.e., derived through photochemical reactions involving precursor pollutants) particles derived from emissions of volatile organic compounds, nitrogen oxides, and sulfur oxides. One of the principal sources of directly emitted particles is entrainment of dust by vehicles moving over paved roads, and this component of particulate matter would increase in proportion to increases in vehicle-miles-traveled associated with cumulative growth. One of the secondary sources of particulate matter, sulfur oxides, would also continue to increase with cumulative growth. In contrast, as discussed above in connection with ozone, emissions of volatile organic compounds and nitrogen oxides would continue a downward trend despite cumulative growth, and thus, their contribution to particulate matter concentrations would diminish. Furthermore, unlike ozone, which is considered a regional pollutant, particulate matter reflects both local and regional sources, and the relative influence of these two basic types of sources changes from day to day. Thus, given the opposing emissions trends and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the cumulative effect relative to particulate matter would be beneficial or adverse; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Alternative 4 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 4 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term, adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 4; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control

programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary from day to day and season to season. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 4 would be beneficial or adverse with respect to particulate matter air quality; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Conclusions

Under Alternative 4, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, because no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value and because emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with construction or demolition activities within the corridor. Over the long term under this alternative, the number of campsites could be reduced, which would result in a local, minor, beneficial effect by reducing the number of campfires and related emissions within the Valley and in Wawona on the typically busy days when the campgrounds would be full. Also, over the long term, the number of day-visitor parking spaces could be reduced, which could result in a local, minor, adverse effect due to increased vehicular congestion (and related emissions) from visitors searching for remaining parking spaces or parking in nondesignated areas. Lastly, under Alternative 4, the potential reduction in the number of facilities for visitors within the Valley would likely reduce the number of visitors to the Valley itself, which would result in a moderate, long-term, beneficial effect within the Valley due to reduced vehicular activity and a negligible, long-term, beneficial effect on regional air quality as a whole.

Alternative 4 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 4 would not overlap in time and space with cumulative construction projects; thus, the local, short-term, adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 4; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary on a daily and seasonal basis. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 4 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Noise

Analysis

General Impacts. As a general matter, under Alternative 4 the acoustical environment in wilderness areas would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights, and the acoustical environment in non-wilderness areas would continue to be influenced by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. The differences between noise conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 4, “natural quiet” would be eliminated as an Outstandingly Remarkable Value along certain river segments; construction or demolition activities could occur; and lower overall visitation levels could occur.

Under Alternative 4, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along those segments of the main stem of the Merced River (wilderness) and the South Fork (wilderness and below Wawona) for which “natural quiet” is currently listed as an Outstandingly Remarkable Value. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Natural quiet has been removed as an Outstandingly Remarkable Value because it is not river-related nor is its presence in the corridor unique to the region or nation.

However, the removal would have a local, negligible, long-term, adverse effect on noise, since one important aspect of this environmental condition—the enjoyment of natural river sounds—has been integrated into the recreation Outstandingly Remarkable Values for each of the three applicable river segments. As such, that particular aspect would continue to be considered for both protection and enhancement. Also, for the two segments in designated Wilderness areas, noise sources would continue to be regulated through implementation of policies contained in the 1989 *Wilderness Management Plan*, such as the wilderness permit system and restrictions on aircraft and snowmobile use. Although the third river segment for which “natural quiet” would no longer be an Outstandingly Remarkable Value (below Wawona) would not be located in a designated Wilderness area, it would be designated 2A+ under this alternative; this designation would essentially eliminate the potential for noise impacts since, as undeveloped open space, new development and related noise sources would generally not be allowed.

The application of management zones under this alternative would ensure that essentially no new human-caused noise sources would be introduced along segments of the corridor that would lie in wilderness areas. Thus, Alternative 4 would have essentially no effect on the noise environment in wilderness areas.

In non-wilderness areas under this alternative, some limited facilities could be constructed and other facilities removed based on the new management zoning designations. Construction or demolition activities could generate substantial amounts of noise during the temporary

construction period. The noise levels generated by typical pieces of construction equipment are shown in table IV-1 under Alternative 2.

At each individual construction or demolition site, the related noise impact would vary depending upon a number of factors, such as the number and types of equipment in operation on a given day, their usage rates, the level of background noise in the area, and the distance between sensitive uses and the construction site. However, in general, given the low background noise levels away from park roadways and the expectation of visitors that the environment be free of excessive noise sources (if not natural quiet), the impact from construction or demolition activities would generally be local, major, short-term, and adverse.

Best management practices are available to reduce noise impacts from equipment associated with construction or demolition activities and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. With each individual construction or demolition project, these best management practices would need to be refined and balanced against other resource goals, such as protection of wildlife. Implementation of best management practices would generally reduce the related impacts from major to moderate, given the temporary nature of construction or demolition projects.

Under Alternative 4, the number of lodging units, campsites, and day-visitor parking spaces could be reduced relative to Alternative 1, because some of these facilities would be located in areas in which they would be inconsistent with the new zone designations. The potential reduction in the number of facilities for visitors within the Valley would likely reduce the number of visitors to the Valley itself. Some visitors would proceed to other areas of the park, such as Wawona and Tuolumne Meadows, while others would simply forego a trip to the park. On balance, fewer visitors would have a local, moderate, long-term, beneficial effect on noise levels within the Valley due to reduced vehicular activity.

Summary of Alternative 4 Impacts. Under Alternative 4, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness Management Plan*; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 4 but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Under Alternative 4, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Under Alternative 4, the potential reduction in the number of facilities for visitors within the Valley would likely reduce the number

of visitors to the Valley itself, resulting in a local, moderate, long-term, beneficial effect on noise levels within the Valley due to reduced vehicular activity.

Cumulative Impacts

Cumulative effects to the ambient noise environment discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect noise within the river corridor or could be affected by noise sources within the corridor.

Past Actions. Development of facilities that include various sources of noise has occurred in and near some segments of the river corridor. Such facilities include roadways, campgrounds, and administrative buildings. Generally, these facilities were developed with limited consideration of potential noise impacts. From a regulatory standpoint, relevant state and federal noise standards typically apply to individual types of noise sources, such as automobiles and buses, rather than to overall noise levels, but the National Park Service has adopted two plans, a Restricted Access Plan and the *Wilderness Management Plan*, that indirectly affect overall noise levels in the river corridor. The Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the indirect effect of limiting the amount of vehicle noise during peak periods by restricting the number of incoming vehicles until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The *Wilderness Management Plan* was developed to preserve a wilderness environment in which the natural world along with the processes and events that shape it are largely untouched by human interference. Implementation of the permit system for overnight camping under the *Wilderness Management Plan* reduces potential noise impacts in those areas where natural quiet is an important element of the visitor experience.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on noise. Short-term, construction-related effects include noise from heavy equipment operations. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which may have a long-term, beneficial impact by replacing automobile trips with a fewer number of transit vehicle trips, depending upon transit ridership levels and the technology used for transit vehicles.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects anticipated not to have a net adverse or net beneficial, long-term effect.

Cumulative projects that could have a net, beneficial, long-term effect on the ambient noise environment include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion.
- Passenger rail improvements in the Amtrak San Joaquin Corridor (DOT, Amtrak) and potential creation of high-speed rail service would encourage travel by alternative (nonprivate vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resource Management Building (NPS) are two projects that would reduce in-Valley vehicle trips for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. However, it is acknowledged that this consolidated parking facility at Yosemite Village is not compatible with the management zones of Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, these projects would have beneficial impact by reducing traffic congestion and related noise in Yosemite Valley.
- Several other regional transportation projects that would have a net beneficial effect on noise by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS), and the Expansion of Mariposa County Transit System (Mariposa Co.).
- Update to the National Park Service's 1989 *Yosemite Wilderness Management Plan*.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would therefore have a beneficial, long-term effect on the ambient noise environment.

To the extent that the transportation-related projects cited above would replace automobile trips in the Valley with bus trips, the anticipated beneficial effect would depend upon ridership levels (and the corresponding number of automobile trips that would be avoided) and the technology selected for the buses. While a bus generates higher maximum noise levels than an automobile, a shift from auto to bus trips would reduce average roadside noise levels, assuming a certain number of auto trips would be displaced. For instance, a typical diesel-powered bus generates the same amount of noise as approximately 6 to 50 typical automobiles at speeds of 40 miles per hour or less (the difference between bus and auto noise is inversely related to speed), based on data compiled by the U.S. Department of Transportation (FHWA 1995). Assuming that a typical electric bus generates approximately 6 dBA less than a typical diesel bus, an electric bus generates the same amount of noise as approximately 2 to 13 typical automobiles. Thus, these projects have the potential to contribute to a cumulative beneficial effect in the Valley, but also have the potential to offset some of the benefit with a combination of low ridership levels and typical diesel bus technology.

Implementation of an update to the *Yosemite Wilderness Management Plan* (NPS) would have a net beneficial, long-term effect on the ambient noise environment in the Merced River corridor because of the emphasis on improving visitor use management as it relates to naturally functioning ecosystems and a quality diverse wilderness experience.

Cumulative projects that could have a net, adverse, long-term effect on the ambient noise environment include:

- Various development-related projects, such as the Mariposa County General Plan Update (Mariposa Co.); Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan
- Wawona Campground Improvement (NPS)

Cumulative growth in the region would have localized, short-term, construction-related impacts; over the long term, these projects would have an adverse effect on local roadside noise levels due to increased vehicle trips. The Wawona Campground Improvement project would construct an additional campground, which may result in increased noise in Section 35.

Reasonably foreseeable projects not anticipated to have a net adverse or beneficial effect on the ambient noise environment, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); South Fork Merced River Bridges Replacement (NPS); El Portal Road Improvement Project (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration; Bridalveil Horse Camp Rehabilitation; and Yosemite Creek Campground Rehabilitation (NPS)
- Land exchanges, such as Yosemite View parcel land exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on the ambient noise environment due to construction activities, and in some cases, these effects would occur within the corridor. Over the long-term, statewide growth and development would accelerate the national trend in increased air travel, resulting in a local, minor, long-term adverse effect in some portions of the corridor in wilderness areas due to increased aircraft overflights and associated intrusive noise levels. In non-wilderness areas, cumulative actions that would provide for increased transit use and reduced automobile use or that would reduce vehicle trips in the Valley could result in a local, minor, long-term, beneficial effect within the corridor depending upon the type of technology used for transit purposes and the extent to which private automobile trips are diverted to transit.

Alternative 4 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 4 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 4; as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the cumulative actions that would tend to reduce motor vehicle trips and the potential reduction in annual visitation to the Valley under this alternative could result in a moderate, long-term, beneficial effect on noise levels in the Valley due to reduced vehicle trips and related noise.

Conclusions

Under Alternative 4, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness Management Plan*; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 4, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Under Alternative 4, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Under Alternative 4, the potential reduction in the number of facilities for visitors within the Valley would likely reduce the number of visitors to the Valley itself, resulting in a local, moderate, long-term, beneficial effect on noise levels within the Valley due to reduced vehicular activity.

Alternative 4 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 4 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 4, as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the cumulative actions that would tend to reduce motor vehicle trips, and the potential reduction in annual visitation to the Valley under this alternative could result in a moderate, long-term, beneficial effect on noise levels in the Valley due to reduced vehicle trips and related noise.

Cultural Resources

General Impacts. Cultural resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those cultural resources that are not related to the Merced River, are not unique to the region or nation, or do not accurately reflect site conditions have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, 1999 Programmatic Agreement), as well as by federal law (e.g., National Historic Preservation Act and Archeological Resources Protection Act).

Cultural resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include river-related cultural resources that are either eligible for or listed in the National Register of Historic Places that are not intended to divert the free flow of the river. The revised Outstandingly Remarkable Values are more inclusive than those in the 1996 *Draft Yosemite Valley Housing Plan* and provide greater focus on the Merced River and resources unique to the region or nation.

Archeological Resources

Analysis

Under the application of management elements for Alternative 4, there is a potential that earthmoving activities would be required as part of construction and/or development. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The proposed management zoning designations for the wilderness areas of the Merced River corridor would not allow for development of any new facilities. Therefore, impacts to archeological resources would occur only as a result of ongoing park operations and programs,

such as facilities maintenance and repair. These actions have the potential to adversely affect entire sites or portions of sites by disturbing intact archeological resources, which are identified as an Outstandingly Remarkable Value. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

Yosemite Valley. Under Alternative 4, the 2A, 2B, and 3A zones could allow for the construction of new facilities and hardened surfaces (e.g., campgrounds, trails, parking areas, restrooms, and picnic areas) and the removal or relocation of existing facilities within the 2A and 2C zones. If this development or construction occurred and earthmoving activities were required, then intact archeological resources, which are identified as an Outstandingly Remarkable Value, could be disturbed and possibly destroyed. Development within these management zones also could concentrate visitor use in the Valley, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. Although the intensity of the impact depends partly upon the nature and location of the undertaking, extensive grading and ground disturbance could result in a local, long-term, minor to moderate, adverse impact to archeological resources.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, the park would conduct data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact. Every effort would be made during the design phase to avoid adverse impacts wherever possible. Where such avoidance would not be feasible or prudent, the park would implement data recover excavations in accordance with the park's 1999 Programmatic Agreement, thereby reducing the intensity of the impact.

Merced River Gorge. Under Alternative 4, the zoning designations could allow for construction of facilities, such as trails, parking areas, restrooms, and picnic areas, within the Merced River gorge. If such construction occurred and earthmoving activities were required, then intact archeological resources, which are identified as an Outstandingly Remarkable Value, could be disturbed. These potential actions also could concentrate visitor use, thereby resulting in impacts such as trampling, surface collection, and erosion. However, by establishing a site monitoring program and by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, reducing the likelihood of visitor-related damage. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological sites would be avoided wherever possible. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

El Portal. The 3C zone could allow for the development of facilities or the removal of existing facilities at Old El Portal, Rancheria Flat, and Railroad Flat. If this development or removal occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The 2B and 2C zones could allow construction of new facilities and hardened surfaces and the removal or relocation of existing facilities. Development within these management zones also could concentrate visitor use at specific locations in El Portal, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered to be a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Wawona. Under Alternative 4, the management zoning designations allow for potential development, maintenance, rehabilitation, or removal of facilities in the Wawona area. If these activities occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological resources would be avoided wherever possible. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact.

Summary of Alternative 4 Impacts. The implementation of potential future actions under the management zones of Alternative 4 would result in a long-term, major, adverse impact to archeological resources due to potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value.

The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Cumulative Impacts

Cumulative impacts to archeological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect archeological resources within the river corridor or in the park vicinity.

Past Actions. Archeological resources are subject to damage from development, vandalism, visitor access, and natural processes. For example, the 1997 flood exposed portions of two archeological resources in El Portal.

In general, the archeological resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous archeological resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. There are archeological resource sites in Yosemite Valley, El Portal, and Wawona that are considered to be at risk from existing facility development. These sites are at or adjacent to trails, structures, utility systems, and other facilities and are subject to ongoing disturbances such as trampling, surface collection, and ground disturbance associated with facility maintenance.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on archeological resources in the vicinity include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- The *Yosemite Valley Plan* (NPS)

- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- South Entrance/Mariposa Grove Site Planning (NPS)
- Resources Management Building, Yosemite West Rezoning Application, South Fork Merced River Bridges Replacement (NPS)
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS), Hazel Green Ranch (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI), Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Merced River Canyon Trail Acquisition (BLM)

The extensive grading and ground disturbance that could be required for these projects could disturb individual archeological resources. Each of these projects is within an archeologically sensitive area, such as a river valley or a mountain meadow. Specific impacts would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The preferred alternative of the *Yosemite Valley Plan* would result in development actions in Yosemite Valley that would require earthmoving activities. However, it is acknowledged that some of this potential development in Yosemite Valley is not compatible with the management zones of Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley*

Plan would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, major, adverse impact on archeological resources.

Conclusions

The implementation of potential future actions under the management zones of Alternative 4 would result in a long-term, major, adverse impact to archeological resources due to the potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value. The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on archeological resources.

Ethnographic Resources

Analysis

Under the application of management elements for Alternative 4, there is a potential that ethnographic resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The management zoning designations for wilderness areas of the Merced River corridor would not allow for the development of any new facilities. Therefore, impacts to ethnographic resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. Since the intensity of impact would depend on the nature, location and design of the undertaking as well as the quantity and nature of the ethnographic resources affected, it is not possible to determine the intensities of those impacts.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement and the cooperative agreement for traditional uses. Every effort would be made to avoid adverse impacts to ethnographic sites. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Yosemite Valley. The management zoning designations under Alternative 4 could allow for development of new facilities and hardened surfaces (e.g., trails, parking areas, restrooms, and picnic areas) and removal and relocation of existing facilities. If these actions were to occur, then ethnographic resources, which are identified as an Outstandingly Remarkable Value, could be

affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

Any such action would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. The park, in consultation with the culturally associated Indian tribes, would make every effort to avoid impacts to ethnographic resources. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

The River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would have a long-term, minor, beneficial impact on ethnographic resources by improving conditions for the recovery of traditionally used plants.

Merced River Gorge. The management zoning designations in the Merced River gorge could allow for construction of facilities, such as trails, parking areas, restrooms, and picnic areas, at the Cascades area. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. Since the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected, it is not possible to determine intensities of these impacts.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

El Portal. The management zoning designations for portions of the river corridor in El Portal could allow for development of new facilities, construction of other facilities (e.g., trails, parking areas, restrooms, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major,

adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Wawona. The management zoning designations for portions of the river corridor through Wawona could allow for ongoing maintenance and rehabilitation of facilities, construction of other facilities (e.g., trails, parking areas, restrooms, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Summary of Alternative 4 Impacts. Alternative 4 could provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas, and the River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential future actions that could occur under the management zones of Alternative 4, which is considered to be a local, long-term, minor to major, adverse impact.

Cumulative Impacts

Cumulative impacts to ethnographic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential

effects of this alternative. The projects identified below include only those projects that could affect ethnographic resources within the river corridor or in the park vicinity.

Past Actions. Ethnographic resources and their traditional cultural associations have been lost or damaged in Yosemite National Park through past development, visitor use, natural events, and widespread disruption of cultural traditions. Nevertheless, Yosemite National Park retains many sites and resources of significance to local and culturally associated American Indians.

In general, the ethnographic resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous ethnographic resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. No present actions have been identified that would affect ethnographic resources in the vicinity of the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects that could adversely affect ethnographic resources; (2) projects that could beneficially affect ethnographic resources; and (3) projects that could either adversely or beneficially affect ethnographic resources.

Examples of projects that could have a cumulative, adverse effect on ethnographic resources include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek

Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)

- Various development-related projects such as, the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); and Resources Management Building (NPS)
- Merced River Canyon Trail Acquisition (BLM)

All of these projects could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places. These projects would have a long-term, adverse impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were damaged and access to traditional use places were facilitated.

Reasonably foreseeable projects that would beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

These projects could result in restoring native plant habitat, which would be a long-term, beneficial impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were restored and access to traditional use places were facilitated.

Reasonably foreseeable projects that would adversely or beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- The *Yosemite Valley Plan* (NPS)

The preferred alternative of the *Yosemite Valley Plan* could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places, and could beneficially affect ethnographic resources by restoring native plant habitat. However, it is acknowledged that some of this potential development in Yosemite Valley is not compatible with the management zones of Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding.

The cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact on ethnographic resources because the long-term, beneficial impacts associated with the management of natural resources and river processes in the vicinity of the Merced River corridor would be partially offset by the long-term, adverse impacts associated with damaging gathering sites or restricting access to traditional use places.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Conclusion

Alternative 4 could provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas, and the River Protection Overlay could result in the restoration of botanic communities in the Merced River corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential future actions that could occur under the management zones of Alternative 4, which is considered to be a local, long-term, minor to major, adverse impact.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Cultural Landscape Resources, including Historic Sites and Structures

Analysis

Under the application of management elements for Alternative 3, there is a potential that cultural landscape resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The management zoning designations for the wilderness areas of the Merced River corridor would not allow development of new facilities. Therefore, impacts to cultural landscape resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to adversely affect cultural landscape resources, which are classified as an Outstandingly Remarkable Value. Impacts would be associated with maintenance activities that remove historic fabric, remove historic structures, or add incompatible facilities within or adjacent to historic structures. Since the intensity of impact would depend upon the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that are affected, it is not possible to determine the intensities of these impacts.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Yosemite Valley. The Merced River, its adjacent riparian corridor and meadows, and viewsheds are considered to be important elements of the Yosemite Valley cultural landscape historic district. The management zones and the River Protection Overlay could allow for the protection and enhancement of these elements of the cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in protecting and/or enhancing the character-defining features of a historic property, and the number of contributing elements of a historic district that were protected and/or enhanced.

The management zoning designations for portions of the river corridor in Yosemite Valley could result in the development of new facilities (e.g., trails), relocation of facilities (e.g., trails, restrooms), removal of facilities, and changes to the historic cultural landscape and to cultural landscape resources. Application of the River Protection Overlay, in combination with the management zones, would allow for the removal or redesign of bridges; however, the historic automobile and footbridges (e.g., Stoneman Bridge, Sugar Pine Bridge, Housekeeping Bridge) are considered to be Outstandingly Remarkable Values, and any future proposal for removal or redesign would be subject to the Section 7 process. Any of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the Valleywide cultural landscape, result in the removal of historic fabric or resource, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the

nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Merced River Gorge. The management zoning designations under Alternative 3 would allow for construction or removal of facilities (e.g., trails, parking areas, restrooms, Cascades residences, and picnic areas). In addition, implementation of the River Protection Overlay would allow for the removal of the Cascades Diversion Dam. If such construction or removal activities were to occur, then cultural landscape resources could be adversely affected by removing resources or by adding incompatible facilities within or adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts prove impossible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

El Portal. The management zoning designations for the river corridor in El Portal could allow for construction of other facilities (e.g., trails, parking areas, restrooms, park operational facilities, employee housing, and picnic areas) and removal or relocation of existing facilities. If these actions were to occur, then cultural landscape resources could be adversely affected by removing historic structures or by adding incompatible facilities adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Wawona. The management zoning designations in the river corridor in Wawona could allow for construction of facilities (e.g., trails, parking areas, restrooms, and picnic areas) and removal of

relocation of existing facilities (e.g., park operational and maintenance facilities). If these actions were to occur, then cultural landscape resources could be adversely affected by removing or altering historic fabric, by removing historic structures, or by adding incompatible facilities within or adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made to avoid adverse impacts in design. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Summary of Alternative 4 Impacts. The management zoning designations and River Protection Overlay could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning designations and the River Protection Overlay could allow for the development of new facilities, the relocation or removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Cumulative Impacts

Cumulative impacts to cultural landscape resources discussed herein are based on analysis of the effects of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect cultural landscape resources within the river corridor or in the park vicinity.

Past Actions. Cultural landscape resources have been lost or damaged in Yosemite through past development, visitor use, and natural events. In wilderness areas, cultural landscape resources include remnants of early stock grazing, trails, and work camps. In Yosemite Valley, Wawona, and El Portal, cultural landscape resources include early hotels, bridges, stores, studios, cabins, farms, and railroad structures that were associated with early Euro-American pioneer settlement and industries. In the Merced River gorge, these cultural landscape resources include segments of the early wagon road and engineering projects. Rapidly disappearing structures and sites in other areas include homestead cabins, barns, road and trail segments, bridges, mining complexes, railroad and logging facilities, blazes, and campsites. These resources are reminders of the area's ranching, grazing, lumbering, and mining history.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem

and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects cultural landscape resources within the Merced River gorge. Cultural landscape resources are protected during construction by implementation of a compliance monitoring program.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could affect cultural landscape resources in the vicinity of the Merced River corridor include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Wawona Campground, Tamarack Campground, Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS)
- The *Yosemite Valley Plan* (NPS)
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Yosemite View parcel land exchange, El Portal (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- The update to the *Yosemite Wilderness Management Plan* (NPS)
- Several water improvement projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Merced River Canyon Trail Acquisition (BLM)
- Update to the *Yosemite Fire Management Plan* (NPS)

Given that each of these actions could result in removal of historic fabric or resources, add noncontributing elements to the historic cultural landscape, or add incompatible facilities within or adjacent to a cultural landscape resource, these cumulative projects would have a long-term, adverse impact on cultural landscape resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

The preferred alternative of the *Yosemite Valley Plan* includes actions in Yosemite Valley that could affect cultural landscape resources. However, it is acknowledged that some of these actions in Yosemite Valley are not compatible with the management zones of Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to

conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

Conclusion

The management zoning designations and River Protection Overlay could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning designations and the River Protection Overlay could allow for the development of new facilities, the relocation or removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

National Historic Preservation Act Section 106 Summary

Under regulations of the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800.9) that address the criteria of effect and adverse effect, the zoning designations and River Overlay Protection proposed under this alternative would allow (but do not prescribe) actions that have the potential to adversely affect significant properties. The National Park Service has determined that selection of this alternative would result in “no effect” to historic properties listed in or eligible for listing in the National Register of Historic Places. The California State Historic Preservation Officer has concurred with this determination.

Visitor Experience

Analysis

General Impacts. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, resources that affect visitor experience that are not related to the Merced River (e.g., rock climbing) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan* and *Resources Management Plan*), as well as by federal law (e.g., the National Park Service Organic Act). Visitor experience Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) include activities such as river-related camping, hiking, picnicking, and opportunities for solitude and enjoyment of natural river sounds and the scenery of riverine habitats, such as riparian forests, meadows, and the aquatic environment.

The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*. Alternative 4 management zoning, in combination with the implementation of Visitor Experience and Resource Protection (VERP) proposed under this alternative (refer to discussions of specific areas below), would provide increased protection for these Outstandingly Remarkable Values compared to the absence of zoning in the No Action Alternative.

Implementation of the VERP framework would have an overall beneficial impact on all recreation Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is designed to protect and enhance the quality of the visitor experience. Over the long term, implementation of VERP could have a beneficial impact on visitor experience because it would protect the visitor experience from adverse impacts associated with visitor use.

For example, if the number of encounters along a segment of trail were selected as an indicator of desired visitor experience, violation of the standard associated with this indicator would result in management action to manage or limit visitor use in the area. The management action could be to redirect some visitors to trails where the standard is not being violated, or to reduce the frequency of shuttle bus stops at the trailhead. This action would have a beneficial impact by discontinuing further visual and ecological degradation of the trail segment and thus protecting the future enjoyment of the trail.

Implementation of the VERP framework would manage visitor use in the Merced River corridor in Yosemite National Park. Because the management actions necessary to protect visitor experience and natural resources are unknown, and it is uncertain how protecting the visitor experience and resources would specifically affect accessibility to the Merced River corridor, analysis of the impacts of implementation of VERP on overall Yosemite visitation, and thus the

accessibility to recreational opportunities, the wilderness, interpretation and orientation facilities, or visitor services, would be speculative. Before new management action were taken, a determination would be made as to whether preparation of environmental documentation to comply with the provisions of the National Environmental Policy Act or other applicable legislation would be required to assess the effects of the action on the environment – including access to visitor experience opportunities.

Recreation

Analysis

The following discussion provides an overview of the types of impacts to recreation resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter the recreational experience or use patterns of these areas compared to the No Action Alternative. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Consequently, the application of management zoning within the wilderness segments would have no effect on the recreation experience within the wilderness.

Outstandingly Remarkable Values within wilderness segments include opportunities for solitude along the river with primitive and unconfined river-related recreation (e.g., day hiking, backpacking, fishing, horseback riding and packing, camping, and enjoyment of natural river sounds). Effects to recreation-related Outstandingly Remarkable Values within wilderness portions of the Merced River are considered beneficial under this alternative, because the proposed zoning would protect the quality of recreational opportunities while precluding new development that could reduce this quality or its availability.

Impacts in Yosemite Valley. Recreation Outstandingly Remarkable Values of Yosemite Valley include opportunities to experience a spectrum of river-related recreational activities, from nature study and sightseeing to hiking. Yosemite Valley is one of the premier outdoor recreation areas in the world. While implementation of VERP under this alternative would protect and enhance these Outstandingly Remarkable Values, the application of proposed management zoning has the potential to limit the spectrum of river-related recreation within Yosemite Valley.

In general, the management zoning prescriptions (primarily zones 2A and 2B) under Alternative 4 focus on minimizing impacts on and restoration of sensitive areas within the river corridor. As a result, management zoning prescriptions under this alternative could discourage use of many areas within the Merced River corridor for socially oriented recreational activities, characterized by spontaneity and group activities, and instead could encourage individually oriented activities characterized by solitude and quiet. Access to and availability and diversity of recreational

opportunities that exist in the corridor could be decreased, while some opportunities could be severely restricted. The recreational opportunities that could be most directly affected include the use of non-motorized watercraft (e.g., rafts, inner tubes, kayaks) and bicycling. Other opportunities that could be indirectly affected under this alternative include day hiking, fishing, sightseeing, photography, nature study, bicycling, climbing, and stock use. The existing trail system would remain unaffected by zoning but could require adjustment over time as a result of VERP monitoring.

Under Alternative 4, management zoning prescriptions could eliminate the existing launch sites from 2A and 2B zones and reduce the potential to develop additional launch and removal sites for non-motorized watercraft (e.g., rafting) in the corridor. Rafting would be consistent with the 2B zone (between Stoneman Bridge and Sentinel Beach), but could occur with less intensity in this zone. The restriction of developed launch and removal sites for rafting, and other non-motorized watercraft, would result in a local, long-term, minor, adverse impact on the visitor experience.

Bicycling could be restricted mostly to roads and a few multi-use paved trails outside the much wider corridor. This alternative would likely not allow the construction of trails for bicyclists in the future, and much of the present bicycle trail system could be eliminated over time. Bicyclists would likely experience more crowded conditions over time, thus altering the quality of the experience. This would result in a local, long-term, minor, adverse impact, because bicyclists could still access paths and roads in east Yosemite Valley, and use the existing road system in west Yosemite Valley.

Management zoning prescriptions (zones 2A and 2B) could reduce the availability of roadside parking near popular rock climbing and hiking/walking locations, particularly between Bridalveil Fall and Cathedral Beach, and near Devils Elbow, thus making access more difficult. This would result in a local, long-term, minor, adverse impact.

Access to the corridor downstream of Sentinel Beach (zoned 2A) for swimming, picnicking, and fishing could be limited, but would provide a low incidence of visitor encounters for those who do use the area, which would be relatively quiet. This could result in a local, long-term, moderate, adverse impact because visitors could be displaced from areas formerly used for higher-intensity recreation. In general, the characteristics of recreational experiences could be altered in many areas as a result of shifting populations within the corridor.

A transit center and/or day-visitor parking facility in Yosemite Valley would be precluded under the management zone prescriptions applied over a quarter-mile boundary in Alternative 4. In addition, it is unlikely that concentrated day-visitor parking areas would be established outside of the quarter-mile boundary, which could result in significantly fewer day visitors. Many day visitors could be displaced to other parts of the park or could be temporarily turned away at park entrances. This could result in a regional, long-term, moderate, adverse impact, because access to recreational opportunities could be denied to a large user group.

Impacts in the Merced River Gorge and El Portal. In the gorge segment, recreational access and availability would change due to the possible elimination of the Cascades picnicking and day-use area.

In El Portal, river-based recreational opportunities could be increased due to management zoning in the vicinity of the Trailer Village, which would eventually be managed as a natural discovery area (zone 2B). This would result in a long-term, negligible, beneficial impact on recreational opportunities in El Portal. Access to the river for fishing, swimming, and kayaking near the sand pit and Patty's Hole would not be altered under this alternative.

Outstandingly Remarkable Values within the gorge and El Portal include a range of river-related recreational opportunities, in particular white-water rafting and kayaking (class III to V), fishing, picnicking, photography, and sightseeing. Effects to recreation-related Outstandingly Remarkable Values within these segments of the Merced River are considered negligible, long-term, and adverse under this alternative, due to possible limitations on access to the river corridor associated with the management zoning.

Impacts in Wawona. Management zoning could result in the removal of formal picnicking facilities from current locations within the corridor, near the Wawona grocery store and Wawona Campground. This result could limit the diversity of recreation in the area and thus have a slight negative effect on some activities; this effect, however, would be accompanied by a beneficial effect of reduced crowding, and improving the value of the river corridor for informal picnicking and other similar activities. Other recreational uses in the Wawona area would not change under this alternative.

The effects of Alternative 4 zoning on camping in Wawona are analyzed in this section under the heading "Visitor Services."

Outstandingly Remarkable Values within Wawona include opportunities to experience a spectrum of river-related recreational activities, from nature study and photography to hiking. Effects on recreation-related Outstandingly Remarkable Values within Wawona of the South Fork of the Merced River would also be considered long-term, minor, and beneficial impact under Alternative 4 because the proposed zoning would protect the range of recreational opportunities while precluding new development that could reduce this range of opportunities or its availability, although this beneficial effect would be somewhat offset by a decrease in the diversity of recreational opportunities in the corridor, such as picnicking at formal facilities.

Summary of Alternative 4 Impacts. Alternative 4 could have a local, long-term, moderate, adverse impact on visitor experience as it relates to access to and availability of recreational opportunities, because of the potential for reduced access to the Valley for day visitors that could result from a reduction of day-visitor parking and from a reduction in intensity of use in the wide corridor in Yosemite Valley. Additionally, the potential exists for a reduction in access to and availability of recreational opportunities (particularly use of non-motorized watercraft).

Cumulative Impacts

Cumulative impacts on visitor experience as it relates to recreation are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified include only those that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions would have a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities (e.g., restrooms) that mitigate adverse effects associated with visitor use.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on visitor experience. Short-term, construction-related effects include travel delay and closure of the area to recreational use. Those effects are mitigated by implementation of a traffic control plan with measures such as strict construction timing restrictions, roadway safety procedures, and the use of flaggers, and signals. Long-term effects are improved access to recreational opportunities along the river corridor and El Portal Road, and easier, more dependable, and safer access for recreational vehicles, buses, and other vehicles to Yosemite Valley and other park destinations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both adverse and beneficial effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to recreation include:

- The Yosemite Area Regional Transportation System (YARTS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River Canyon Trail Acquisition (BLM)

These projects would provide increased access for visitors to the park and expand recreational opportunities in the vicinity of the park.

Reasonably foreseeable projects that could have both adverse and beneficial impacts include:

- The *Yosemite Valley Plan* (NPS)
- The update to the *Yosemite Wilderness Management Plan* (NPS)

These projects have the potential to enhance the quality of the visitor experience in the wilderness and Yosemite Valley but also could result in the removal of existing recreational facilities. For example, the *Wilderness Management Plan* could prescribe the closure of the High Sierra Camps.

The structures would remain to be interpreted as cultural resources. This change could be considered a local, long-term, adverse impact to some users, due to the loss of a unique lodging experience in the wilderness. This action could also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness, a reduction in stock impacts, improvements in scenic and natural quiet, and improvements in opportunities for solitude and a primitive and unconfined recreational experience.

Reasonably foreseeable projects that could have a net adverse effect on visitor experience include:

- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); Hazel Green Ranch (Mariposa Co.); and the Yosemite West Rezoning Application (NPS)

These projects could increase visitor use in the park and in the river corridor and could contribute to increased congestion and reduce the quality of specific, solitude-based recreational opportunities in the park.

The cumulative projects would have a long-term, negligible, beneficial impact, because the beneficial impacts associated with increased visitor access and expanded recreational opportunities would be partially offset by the adverse impacts associated with the removal of specific recreational opportunities.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on recreation as it relates to access to and availability of recreational opportunities, because of the potential for reduced access to the Valley for day visitors that could result from a reduction of day-visitor parking and from a reduction in intensity of use in the wide corridor in Yosemite Valley pursuant to Alternative 4 management zoning. This adverse impact has been partially offset by beneficial impacts associated with an increase in regional visitor access, an expansion of recreational opportunities, and improved quality of the natural environment.

Conclusions

Alternative 4 could have a regional, long-term, moderate, adverse impact on visitor experience as it relates to access to and availability of recreational opportunities, because of the potential for reduced access to the Valley for day visitors that could result from a reduction of day-visitor parking and from a reduction in intensity of use in the wide corridor in Yosemite Valley. Additionally, the potential exists for a reduction in access to and availability of recreational opportunities (particularly use of non-motorized watercraft).

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on recreation as it relates to access to and

availability of recreational opportunities, because of the potential for reduced access to the Valley for day visitors that could result from a reduction of day-visitor parking and from a reduction in intensity of use in the wide corridor in Yosemite Valley pursuant to Alternative 4 management zoning. This adverse impact would be partially offset by beneficial impacts associated with an increase in regional visitor access, an expansion of recreational opportunities, and improved quality of the natural environment.

Interpretation & Orientation

Analysis

The following discussion provides an overview of the types of impacts to interpretation and orientation that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter interpretation or orientation of these areas compared to the No Action Alternative. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue as currently managed. There would be no impact compared to the No Action Alternative.

Impacts in Yosemite Valley. Under Alternative 4, the availability and diversity of interpretation, orientation, education, and information services within the corridor could change to some extent due to management zoning prescriptions. Most interpretive programs currently offered by park rangers and park partners could continue in Yosemite Valley, although the locations of programs could change and the size of groups served could decrease due to management zoning.

This alternative would limit the range of interpretive programs and services in Yosemite Valley as a result of management zoning that would direct visitor access to particular areas along the corridor (such as 2C zones) and away from other areas (such as 2A and 2B zones). For example, management zoning prescriptions (zone 2A) would allow only self-guided interpretation between Sentinel Beach and Bridalveil Fall. Ranger-led group walks and talks would be limited in frequency and size in areas zoned 2A and 2B in Yosemite Valley. Marked trails and exhibits and a full variety of interpretive programs would be allowed within the wide corridor at only a few areas, such as Cathedral Beach (2C), El Capitan Picnic Area (2C), Happy Isles (2D), and Sentinel Beach (2C). Interpretive programs currently offered by park partners, such as school programs by the Yosemite Institute and tram tours by the concessioner, would be restricted in a manner similar to ranger-guided programs. Amphitheater programs could continue at Lower Pines Campground.

Management zoning in the wide corridor would nearly preclude the development of a transit center and/or day-visitor parking facility in Yosemite Valley. Visitor orientation would likely remain at the present visitor center, with the same impacts as in Alternative 1.

These changes could result in a local, long-term, moderate, adverse impact on visitor experience due to limitations on the frequency and size of ranger-led walks, and locations of marked trails, exhibits, and other interpretive programs.

Impacts in the Merced River Gorge and El Portal. There are no interpretive programs currently offered in the gorge or in El Portal. Under Alternative 4, this condition would not change (compared to Alternative 1). Management zoning under Alternative 4 would not affect existing interpretive signs and exhibits.

Impacts in Wawona. Amphitheater programs could continue at Wawona Campground. Elsewhere in the corridor, zoning would have adverse effects. Interpretive living-history programs in the Pioneer Yosemite History Center in Wawona would be inconsistent with the 2B management zoning and could be discontinued in the river corridor. Application of the 1A, 2A, and 2B management zoning within the quarter-mile river corridor could also limit the types of interpretive programs offered as well as the ability to construct trails and erect signs and exhibits in Wawona. Other interpretive programs in Wawona would likely remain unchanged. Overall, Alternative 4 would have a long-term, moderate, adverse impact on interpretation and orientation due to the possible loss of these services at the Pioneer Yosemite History Center, and limits on signs and exhibits in Wawona in the quarter-mile Merced River corridor.

Summary of Alternative 4 Impacts. Alternative 4 could have a local, long-term, moderate, adverse impact on visitor experience as it relates to access to and availability of interpretation and orientation programs and services. The impact is moderate, because although there could be a substantial limit to the range and location of programs offered for the visitor in Yosemite Valley and Wawona, as well as limits on the number of visitors that could be served at any one time, visitors would still have access to interpretive programs and services elsewhere in the park.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to interpretation and orientation are based on analysis of past and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect visitor interpretation and orientation within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under the jurisdiction of these agencies. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to orientation and interpretation include:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)

These projects could enhance the quality of the visitor experience by expanding interpretation and orientation services in Yosemite Valley and Wawona.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

This planning effort could prescribe the closure of the Merced Lake High Sierra Camp. The potential discontinuation of visitor use of the Merced Lake High Sierra Camp would disrupt the High Sierra Camp loop-trip experience and the ranger-led interpretive hikes in the wilderness. On the other hand, this could result in a beneficial effect for other user groups who would benefit from a reduction in facilities in the wilderness and enhanced opportunities for solitude and self-guided interpretive experiences.

The cumulative projects would have a long-term, minor, beneficial impact, because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by the potential loss of ranger-led hikes in the wilderness.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on interpretation and orientation, because there could be a substantial limit to the range and location of programs offered for the visitor in Yosemite Valley and Wawona, as well as limits on the number of visitors that could be served at any one time. This adverse impact would be partially offset by the beneficial impacts associated with an increase in interpretation and orientation programs and services associated with the cumulative projects.

Conclusions

Alternative 4 could have a local, long-term, moderate, adverse impact on visitor experience as it relates to access to and availability of interpretation and orientation programs and services. The impact is moderate, because although there could be a substantial limit to the range and location of programs offered for the visitor in Yosemite Valley and Wawona, as well as limits on the number of visitors that could be served at any one time, visitors would still have access to interpretive programs and services elsewhere in the park.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on interpretation and orientation, because there could be a substantial limit to the range and location of programs offered for the visitor in

Yosemite Valley and Wawona, as well as limits on the number of visitors that could be served at any one time. This adverse impact would be partially offset by the beneficial impacts associated with an increase in interpretation and orientation programs and services associated with the cumulative projects.

Visitor Services

Analysis

The following discussion provides an overview of the types of impacts to visitor services that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter visitor services within these areas compared to the No Action Alternative. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue.

Impacts in Yosemite Valley. Management zoning prescriptions under Alternative 4 could result in an overall reduction in the availability and diversity of camping and lodging accommodations in the Merced River corridor. Certain facilities, such as Housekeeping Camp, would be inconsistent with the 2B management zones and could be removed under this alternative.

Currently, there is a shortage of camping and lodging opportunities relative to visitor demand during peak summer months, and this situation would be perpetuated as visitation, and thus demand, increase over time. This is particularly true for campsites in Yosemite Valley, including Camp 4 (Sunnyside Campground), North Pines Campground, and Upper and Lower Pines Campgrounds.

In east Yosemite Valley, application of 2B management zoning could result in the removal of about half of the sites at Lower Pines Campground and the removal of North Pines Campground. The quarter-mile boundary in Yosemite Valley would mostly preclude the relocation of these campsites elsewhere in Yosemite Valley.

The number of lodging units in Yosemite Valley could also decrease. Housekeeping Camp could be eliminated due to inconsistencies with management zoning (2B) and the River Protection Overlay, as could four buildings at Yosemite Lodge. Housekeeping Camp is typically full during peak summer months, and Yosemite Lodge is typically full all year.

Management zoning prescriptions under Alternative 4 could result in an overall reduction in the availability of camping and lodging accommodations in Yosemite Valley. This would likely force

visitors to plan much further ahead to secure overnight accommodations, particularly during peak summer months. Overall, Alternative 4 could result in a local, long-term, moderate, adverse impact on visitor services.

The National Park Service, park partners, and the primary park concessioner would continue to operate most existing food service and retail outlets and thus could continue to meet visitor demand. Therefore, there would be no beneficial or adverse impacts associated with these aspects of visitor services.

Impacts in the Merced River Gorge and El Portal. There are no visitor services currently offered in the gorge. Visitor services available in El Portal are largely run by private businesses (e.g., lodging, restaurants, etc.) and would not be affected by Alternative 4.

Impacts in Wawona. During peak summer months, Wawona Campground and the Wawona Hotel are typically full. Approximately one-third of the campsites at Wawona Campground would be located within the River Protection Overlay and could be relocated or removed. This would further exacerbate the park's ability to meet demand in Wawona, especially during peak summer months. If the number of campsites were to decrease, there would be a local, long-term, minor, adverse impact on visitor experience due to the reduction of campsites in the park.

Summary of Alternative 4 Impacts. Actions taken under Alternative 4 could result in a local, long-term, moderate, adverse impact on access to and the availability of visitor services. Although visitors would still have access to overnight camping and lodging opportunities, the park would be increasingly unable to meet demand for overnight accommodations, unique lodging opportunities could be eliminated, and many visitors could be displaced from the corridor, from Yosemite Valley, and from the park.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. Upper and Lower River Campgrounds and part of Lower Pines Campground were closed following damage sustained during the 1997 flood. This resulted in a decrease in the overall number of campsites available to visitors in the Valley. Similarly, lodging units at the Yosemite Lodge were removed as a result of flood damage and have not been replaced.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Examples of projects that could have a cumulative, beneficial effect on visitor services include:

- The Yosemite Area Regional Transportation System (YARTS)

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Garrotte Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); and the Yosemite West Rezoning Application (NPS)

These projects could improve transportation to and from the park, which would ultimately have a beneficial effect on visitor services by providing increased access for visitors staying outside the park. In addition, the number of campsites and lodging units in the park and in the park vicinity could increase, which would improve visitor services for park visitors.

Reasonably foreseeable projects that could have a net adverse effect on visitor services include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. This change could affect the ability to meet the lodging demand in the corridor and the park and could be considered an adverse impact, due to the loss of a unique lodging experience in the wilderness.

Examples of projects that could have a cumulative mixed effect on visitor services include:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* proposes restoration of degraded areas and a reduction of development within the Merced River ecosystem while enhancing the quality of the visitor experience in Yosemite Valley. Visitor services could be improved by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The *Yosemite Valley Plan*, however, would prescribe a reduction in camping and lodging units in Yosemite Valley (although Yosemite Lodge would be expanded), which would have an adverse effect on the provision of visitor services. However, it is acknowledged that some of the components of the *Yosemite Valley Plan* (for example, the expansion of a portion of Yosemite Lodge and the development of Camp 6) would not be compatible with the management zoning in Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* would likely have a local, long-term, adverse impact on visitor services due to a likely reduction in the number of overnight accommodations in the Valley.

These cumulative projects would have a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, moderate, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. Although visitors would still have access to overnight camping and lodging opportunities, the park would be increasingly unable to meet demand for overnight accommodations, unique lodging opportunities could be eliminated, and many visitors could be displaced from the corridor, from Yosemite Valley, and from the park pursuant to Alternative 4 management zoning. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Conclusions

Actions taken under Alternative 4 could result in a local, long-term, moderate, adverse impact on access to and the availability of visitor services. Although visitors would still have access to overnight camping and lodging opportunities, the park would be increasingly unable to meet demand for overnight accommodations, unique lodging opportunities could be eliminated, and many visitors could be displaced from the corridor, from Yosemite Valley, and from the park.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, moderate, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. Although visitors would still have access to overnight camping and lodging opportunities, the park would be increasingly unable to meet demand for overnight accommodations, unique lodging opportunities could be eliminated, and many visitors could be displaced from the corridor, from Yosemite Valley, and from the park pursuant to Alternative 4 management zoning. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Wilderness Experience

Analysis

The following discussion provides an overview of the types of impacts to the wilderness experience that could occur within the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning, the River Protection Overlay).

Under Alternative 4, management zone prescriptions applied to wilderness areas within the Merced River corridor reflect existing conditions. The wilderness zones include trailed areas with heavy use, trailed areas with light use, and untrailed areas. Most visitors experience the

wilderness area by foot, though there is a small percentage of stock use. Heavy Use Trails (zone 1C), particularly en route to the wilderness via Little Yosemite Valley, provide the least opportunity for solitude, as encounters with other visitors are likely to be frequent. In the Traveled Travel zones (1B), visitor encounters would be infrequent, except at key trail junctions and camping areas (e.g., near Merced Lake High Sierra Camp). In the Untraveled zones (1A), there would be a very high potential for solitude and primitive camping experiences due to the remoteness of the area.

Management zoning prescriptions under this alternative would not change access to the wilderness or access to backpackers campgrounds in the wilderness.

Overall, access to the wilderness within the Merced River corridor would continue to be managed under the current wilderness permit system, and primitive camping and opportunities for solitude would remain available. At present, the park is able to accommodate visitor requests for wilderness permits parkwide, although demand specifically for access to the upper reaches of the Merced River corridor (particularly in Little Yosemite Valley) exceeds the availability of wilderness permits as controlled by the quota system. This condition would likely continue under Alternative 4 in order to maintain the management direction that visitors have the ability to experience solitude and engage in a primitive camping experience in the wilderness.

Summary of Alternative 4 Impacts. The wilderness experience under Alternative 4 would be the same as that for Alternative 1. Therefore, this is considered to have no impact under Alternative 4.

Cumulative Impacts

Cumulative effects on the wilderness experience are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect the wilderness experience within the river corridor or in the park vicinity.

Past Actions. The wilderness permit/trailhead quota system, established in 1974-1976 set limits for the numbers of people allowed to enter the wilderness per day per trailhead. These limits were based on extensive research and monitoring to assess capacity based on ecological and social considerations, and were in response to exceptionally high levels of use in the early- to mid-1970s. This system has had beneficial impacts on the wilderness experience through implementation of a quota system to protect natural resources.

Present Actions. The wilderness permit/trailhead quota system continues to limit and/or disperse use based on trailhead access, and thus provides the beneficial impact of improved experience of natural values due to resource protection.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to wilderness experience include:

- Several planning or restoration efforts are in various stages of development, including the *Fire Management Plan* (NPS); the *Fire Management Action Plan for Wilderness* (USFS); the Sierra Nevada Framework for Conservation and Collaboration (USFS); Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); the Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus); the Tuolumne Meadows Development Concept Plan (NPS); and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Merced Canyon River Trail Acquisition (BLM)

These projects could result in the restoration of wilderness areas within the park and in the park vicinity. Any improvement to the wilderness ecosystem is considered to be a long-term, beneficial impact.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could affect the ability to meet lodging demand and would impact some users due to the loss of a unique lodging experience in the wilderness. In addition, the potential discontinuation of visitor use of the High Sierra Camps would eliminate the High Sierra Camp loop-trip experience. On the other hand, this action might also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness and a reduction in stock impacts. These individuals could benefit from improvements in scenic and natural quiet qualities, opportunities for solitude, and an overall primitive recreational experience.

These cumulative projects would have a long-term, minor, beneficial impact on the wilderness experience, because the wilderness ecosystem would be improved and would only be partially offset by the long-term, adverse impact of removing the High Sierra Camps.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Conclusions

The wilderness experience under Alternative 4 would be the same as that for Alternative 1. Therefore, this is considered to have no impact under Alternative 4.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Social Resources

Land Use

Analysis

General Impacts. Under the management zones for Alternative 4, expansion and/or development of uses and facilities within the river corridor could occur, altering the intensity of the use of a specific site. However, the basic land use designation of Yosemite National Park (i.e., public parklands) would not change under Alternative 4, and National Park Service policy concerning the acquisition of private lands within or adjacent to the park is compatible with current plans and policies and would not change under Alternative 4; therefore, there would be no land-use impacts on parklands or other properties within or adjacent to the park.

Private property within the river corridor in El Portal and Wawona is not zoned under the *Merced River Plan*. Management zones in the *Merced River Plan* would not result in conflicts with existing land uses or existing plans and policies and would not induce changes in those land uses.

Section 8 of the Wild and Scenic Rivers Act withdraws lands within the boundaries of Wild and Scenic Rivers from “public entry, sale, or disposition under the public land laws of the United States.” This section of the Wild and Scenic Rivers Act preempts public land laws, such as the 1872 General Mining Act, under which nonreserved public lands may be disposed of for private use. However, because Yosemite National Park is by definition “reserved land,” this provision is largely irrelevant to the *Merced River Plan*. Furthermore, much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772).

In accordance with Section 9 of the Wild and Scenic Rivers Act, lands within one-quarter mile of the main stem and South Fork of the Merced River have been withdrawn from all forms of appropriation under mining and mineral leasing laws of the United States. Because much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772), no additional lands have been identified for withdrawal under the *Merced River Plan*.

Summary of Alternative 4 Impacts. Under Alternative 4, the adoption of management zoning is considered to be a short-term, minor, beneficial impact. Since the basic land use of the park would not change, no impacts to land uses would occur as a result of Alternative 4.

Cumulative Impacts

Cumulative impacts to land use discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect land use within the river corridor and in the immediate vicinity of Yosemite National Park.

Past Actions. In general, land uses in the Merced River corridor have been determined by past decisions on the development, relocation, and removal of specific facilities. Development within the Merced River corridor has occurred since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) does not affect the land uses within the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that are anticipated to change overall land uses can be separated into local and regional projects. Local projects (i.e., those within the park and involving parklands) being carried out under the direction of the National Park Service include:

- The *Yosemite Valley Plan*, the Yosemite View parcel land exchange, El Portal; South Entrance/Mariposa Grove Site Planning; Resources Management Building; Yosemite West Rezoning Application; Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan; Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and Crane Flat Campus Redevelopment (NPS, YNI)
- Several Yosemite campground rehabilitation projects include Tamarack Campground, Bridalveil Horse Camp, Yosemite Creek Campground, Hodgdon Meadow Campground, and the Wawona Campground Improvement (NPS)

Local projects have the potential to change land uses within the park. For example, the *Yosemite Valley Plan* could change existing land uses and the intensity of existing land uses within portions of the Merced River corridor in Yosemite Valley as well as in El Portal and Wawona. These changes to land uses would be dictated by the development plans outlined in the *Yosemite Valley Plan*. The preferred alternative of the *Yosemite Valley Plan* proposes development and/or redevelopment of portions of Upper Pines Campground, Curry Village, and Yosemite Lodge. However, it is acknowledged that this development and/or redevelopment is not compatible with the management zones of Alternative 4. The *Merced River Plan* will guide future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Since components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the cumulative impacts of the *Yosemite Valley Plan* are unknown.

Another example of a local project is the land exchange between the National Park Service and the owner of a parcel of private property near the park's western entrance at the El Portal Administrative Site. The owner of the private parcel would receive a plot of National Park Service land adjacent to the owner's hotel properties in exchange for the landowner's plot two miles west of the Arch Rock Entrance Station. This land exchange would allow the National Park Service to construct facilities, such as a vehicle turnaround area, that would increase the vehicle handling efficiency of the entrance station. The U.S. Congress has passed legislation allowing this land exchange to occur, but it is not yet completed. Though completion of the land exchange would alter the land use for those two plots of land, the overall effect would be negligible because the two plots of land are close together and there would be no net change in the amount of each type of land use in the area. A similar land exchange would also take place in Wawona. The Seventh Day Adventist recreational camp is located in Wawona on privately owned land inside the boundaries of Yosemite National Park. The privately owned land occupied by the camp literally abuts portions of Yosemite's designated Wilderness. To protect designated Wilderness this project would exchange lands between the National Park Service and the Seventh Day Adventist camp.

Regional projects (those that take place outside of the park) that would affect land use and planning within the Yosemite region and are not under National Park Service jurisdiction include:

- Projects undertaken by county governments include: Hazel Green Ranch (Mariposa Co.); Mariposa County General Plan Update (Mariposa Co.); Yosemite Motels, El Portal (Mariposa Co.); Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); Buildout of the City of Merced, General Plan (City of Merced); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); and Evergreen Road Improvements (multi-agency, see Appendix G)
- Projects undertaken by federal agencies include: South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM); Sierra Nevada Framework for Conservation and Collaboration (USFS); and Merced River Canyon Trail Acquisition (BLM)

Regional projects have the ability to alter land use in the park vicinity. An example of such a project would be the Mariposa County General Plan Update, which is scheduled to begin in 2000. Although the plan does not explicitly call for land use changes, it does provide general guidance for land use, zoning, and development throughout Mariposa County, which could likely impact land use in the long term.

Another regional project that could affect land use is the *South Fork and Merced Wild and Scenic River Implementation Plan*. This plan covers management of lands along river segments including: a 15-mile portion of the main stem extending from the El Portal Administrative Site to a point 300 feet upstream of the confluence with Bear Creek; a 21-mile segment of the South Fork from the park boundary to the confluence of the Merced River; and a 3-mile segment of the South Fork just upstream of Wawona, where the National Park Service has jurisdiction over the north side of the river and the U.S. Forest Service has jurisdiction over the south side. The plan calls for the long-term protection of natural and cultural resources, and managing the area for the

use and enjoyment of visitors in a way that will leave the resource unimpaired for future use and enjoyment as a natural setting.

The impact intensity of planning projects would depend upon the extent to which the plan's recommendations were implemented. Land uses would most likely shift in various areas. The short-term impacts on land use would be neither adverse nor beneficial; likewise, long-term impacts on land use would be neither an adverse nor beneficial.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Conclusions

Since the basic land use designation would not change, no impacts to land uses would occur as a result of Alternative 4.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Transportation

Analysis

General Impacts. The following discussion provides an overview of the types of transportation impacts that could occur within the Merced River corridor from application of Alternative 4.

Under Alternative 4, the 2B zone and the River Protection Overlay could allow for the removal of overnight accommodation facilities in the park (campsites or lodging) from within the Merced River corridor, which would generate more regional traffic (entering and leaving the park) and local traffic (within the park and within Yosemite Valley). Removal of overnight accommodation facilities would cause visitors who otherwise (under Alternative 1) would stay overnight in the park to use campsites and/or lodging outside the park (i.e., to become day visitors, or more precisely, local overnights). That shift to higher numbers of local overnights would increase the amount of traffic entering and leaving the park, because visitors would need to make two trips per day between their out-of-park accommodations and attractions within the park. This would have a long-term, minor, adverse impact on traffic conditions at park entrances and on park roadways (including in Wawona and El Portal) by slightly increasing delays experienced by queues of backed-up vehicles, and slightly increasing congestion and delays experienced by drivers on roadways.

The 2A and 2B zones under Alternative 4 could allow for the removal of parking spaces from the Merced River corridor. If parking spaces were removed, then more traffic congestion would occur within the park because day-visitor parking demand (assumed to be the same as under Alternative 1) could greatly exceed the supply of day-visitor parking spaces. Visitors unable to find an authorized place to park would circle around, which would increase traffic volumes at

congested locations. This would have a long-term, major, adverse impact on traffic conditions in Yosemite Valley by substantially increasing congestion and delays experienced by drivers. If parking spaces were built in areas outside the river corridor (e.g., near Yosemite Village), the above-cited unmet parking demand could be somewhat reduced, but would not be eliminated; the adverse effects on traffic conditions in the Valley would still occur, though at a somewhat lower level of intensity. It is assumed that the Restricted Access Plan would be implemented much more often under Alternative 4, and during periods when access were restricted, day visitors prevented from entering Yosemite Valley would be displaced to other areas of the park or to areas outside of the park. That displacement to less-congested areas would reduce the effect on traffic conditions in the Valley to a negligible, adverse impact. Traffic effects on park roadways outside Yosemite Valley would be a long-term, minor, adverse impact.

Additionally, the possible removal of parking spaces as a result of the 2A and 2B zones and the resulting inability of the remaining supply to accommodate the day-visitor parking demand under Alternative 4 could increase conflicts between vehicles, as visitors unable to find an authorized space could decide to park in unauthorized/improper areas. This would have a long-term, major, adverse impact on traffic safety conditions by substantially increasing the potential for traffic safety hazards. It is assumed that the Restricted Access Plan would be implemented much more often under Alternative 4, and during periods when access were restricted, day visitors prevented from entering Yosemite Valley would be displaced to other areas of the park or to areas outside of the park. That displacement to less-congested areas would reduce the effect on traffic safety conditions in the Valley to a minor, adverse impact. The resulting minor, adverse impact is attributed to the expectation that unauthorized/improper parking could still occur under the Restricted Access Plan, because park overnight visitors would be allowed to enter the Valley and would not be prohibited from driving during their stay, potentially parking in unauthorized/improper spaces at or near their destinations.

Under Alternative 4, the River Protection Overlay could allow for the removal of vehicle bridges over the Merced River, altering the circulation patterns of vehicles (private, regional public transit, Valley shuttle, etc.). This would have a long-term, moderate, adverse impact on traffic conditions in Yosemite Valley by moderately increasing traffic volumes on the remaining bridges (and roadways used to access those bridges). It is assumed that the Restricted Access Plan would be implemented much more often under Alternative 4, and during periods when access were restricted, day visitors prevented from entering Yosemite Valley would be displaced to other areas of the park or to areas outside of the park. That displacement to less-congested areas likely would lower traffic volumes on roadways in the Valley enough to reduce the effect of bridge removal to a minor, adverse impact (i.e., slightly increasing traffic volumes on the bridges that remain and on roadways used to access those remaining bridges).

Summary of Alternative 4 Impacts. The implementation of potential future actions in accordance with the management zoning and the River Protection Overlay of Alternative 4 is considered to be a long-term, major, adverse impact, because an increase in traffic congestion could result from the decrease in overnight accommodations and parking spaces within the river corridor, the inability to accommodate day-visitor parking demand, and from removal of vehicle bridges over the Merced River.

Cumulative Impacts

Cumulative transportation effects discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect access and transportation in the vicinity of the river corridor.

Past Actions. Development of a circulation system that includes roadways, parking areas, and bridges has occurred within and in the vicinity of Yosemite National Park. This circulation system was developed to provide access to the park and the surrounding areas. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles until the traffic volume and parking demand in the Valley decreases sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on transportation. Short-term, construction-related effects include visitor delays and visitor safety through the construction work zone. Those effects are mitigated by implementation of a traffic control plan, with measures such as strict construction timing restrictions, roadway safety procedures, flaggers, and signalling. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which would be a long-term, beneficial impact.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have adverse effects.

Reasonably foreseeable projects that could have a cumulative, long-term, beneficial effect on regional transportation include the following:

- The Yosemite Area Regional Transportation System (YARTS)
- San Joaquin Corridor Rail Projects (DOT, Amtrak)
- The Yosemite West Rezoning Application (NPS)
- The *Yosemite Valley Plan* (NPS)

The aforementioned projects, individually and in combination, would reduce congestion by encouraging travel to the park by alternative (non-private vehicle) modes. For example, YARTS is a collaborative, multi-agency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion. The initial YARTS service would be a demonstration project (scheduled to begin by early summer 2000), with a target market of visitors staying overnight in the gateway communities and employees working at Yosemite National Park who

live in the gateway communities. A successful YARTS would reduce the number of day visitors arriving in private vehicles. Similarly, the Yosemite West Rezoning Application would include a provision for a regional staging area to provide visitor parking and linkage to regional public transportation systems. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. However, it is acknowledged that this consolidated parking facility at Yosemite Village is not compatible with the management zones of Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 3, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. Together, these projects would have a beneficial impact by reducing traffic congestion in Yosemite Valley.

Reasonably foreseeable projects that could have a short-term, adverse effect but a cumulative, long-term, beneficial effect on regional transportation include:

- Highway 41 Extension (Madera Co.)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.)
- Mariposa Creek Pedestrian/Bike Path (Mariposa Co.)
- Evergreen Road Improvements (multi-agency, see Appendix G)

Although the above projects would have site-specific and short-term, adverse effects (e.g., construction-related transportation effects), the general goal of these projects is to improve regional transportation circulation and safety.

Reasonably foreseeable projects that could have a short-term adverse effect on regional transportation include:

- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects and the A-Rock Reforestation (USFS, Stanislaus); and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June

Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); Crane Flat Campus Redevelopment (NPS, YNI); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and the Resources Management Building (NPS)

The adverse effects associated with the above projects would be short term in nature, primarily related to construction-generated traffic on roadways serving the project sites. These projects would not result in any net long-term effects to regional transportation.

Given the potential for a reduction in the number of day visitors arriving in private vehicles, these cumulative projects would have a long-term, minor to moderate, beneficial impact on the regional transportation system. The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented. The short-term construction-related traffic impacts that would occur from development of site-specific projects would not appreciably alter these long-term, beneficial impacts.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, moderate, adverse impact on traffic and traffic safety conditions in Yosemite National Park, because the major, adverse impacts associated with Alternative 4 would be partially offset by the long-term, minor to moderate, beneficial impacts associated with the cumulative projects.

Conclusions

The implementation of potential future actions in accordance with the management zoning and the River Protection Overlay of Alternative 4 is considered to be a long-term, major, adverse impact because an increase in traffic congestion could result from the decrease in overnight accommodations and parking spaces within the river corridor, the inability to accommodate day-visitor parking demand, and from the removal of vehicle bridges over the Merced River.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, moderate, adverse impact on traffic and traffic safety conditions in Yosemite National Park, because the major, adverse impacts associated with Alternative 4 would be partially offset by the long-term, minor to moderate, beneficial impacts associated with the cumulative projects.

Scenic Resources

Analysis

General Impacts. Scenic Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River or not unique to the region or nation have been removed (e.g., the confluence of tributaries in Wawona, magnificent views of

Triple Divide Peak and the Sierra Crest within the wilderness segment of the South Fork). Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan* and *Resources Management Plan*), as well as by federal law (e.g., the 1916 Organic Act). Scenic Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) are now focussed on spectacular views from the river and its banks. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Implementation of the Visitor Experience and Resource Protection (VERP) framework would have a local, long-term, minor, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is intended to institutionalize an ongoing adaptive management program in which park staff would continuously monitor visitors and resources, identify discrepancies between existing and desired visitor experiences and resource conditions, and take action to achieve desired conditions. If monitoring determined that desired visitor experiences and resource conditions were not being met in a particular management zone, management subzone, or segment, then management actions could be undertaken. An example of a management action that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leaved trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This likely would open previously closed views and improve the texture and lighting of the foreground of any landscape viewable from the Merced River corridor.

The following discussion provides an overview of the types of impacts to scenic resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., management zoning, the River Protection Overlay, the VERP framework).

Impacts in the Wilderness. Scenic Outstandingly Remarkable Values of the wilderness include views from the Merced River and its banks of the exposed bedrock riverbed, Merced Lake and Washburn Lake, the Bunnell Cascades, the confluence of tributaries, a large concentration of granite domes, and the Clark and Cathedral Ranges. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (as prescribed by zones 1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning and the River Protection Overlay are not anticipated to alter use patterns or existing facilities within the wilderness reaches of the Merced River, these management elements would limit the type of new facilities (e.g., campsites with facilities are prohibited in the 1B zone) that could be built in the Merced River corridor. This would limit potential adverse effects on scenic resources associated with disruption of native vegetation or placement of facilities in undeveloped areas. The application of management zoning and the River Protection Overlay within wilderness segments would have a local, long-term, negligible, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in Yosemite Valley. The proposed 2B zoning in east Yosemite Valley and the 2A zoning in west Yosemite Valley applied over a quarter-mile boundary are more restrictive than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources, an important component of the scenic landscape within the Valley. The following actions and facilities would be inconsistent with the proposed 2A or 2B zoning and could be modified under this alternative.

- Several existing facilities (e.g., Housekeeping Camp, North Pines and portions of Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed.
- Developed launch and removal sites for non-motorized watercraft are minimal compared with Alternative 1 and could be reduced.
- Visitor access to the Merced River could be directed away from sensitive riparian areas zoned 2A and 2B to specific, more resilient locations such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C).
- Large areas of sensitive habitats, such as California black oak woodland and El Capitan Meadow, would be zoned 2A to receive increased protection over existing conditions.

Some overnight accommodations (Housekeeping Camp, North Pines and portions of Lower Pines Campgrounds, a portion of Yosemite Lodge) would be inconsistent with the proposed 2B zoning and could be removed. Decreasing the total number of overnight accommodations in Yosemite Valley would likely have a local, long-term, minor, beneficial effect on scenic resources within the Merced River corridor, because of the removal of structures that currently intrude into the scenic landscape in some areas.

Visitor access characterized by moderate to high numbers of encounters with other park users in the Merced River corridor would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C). These 2C-zoned areas could be managed to minimize effects on natural areas within the corridor that are currently unprotected. The management zoning could have a local, long-term, moderate, adverse impact on visual resources at these locations, due to the potential for further degradation of natural vegetation caused by concentrated visitor access and use. However, concentrating visitor use at these locations in the Merced River corridor would allow for increased protection and restoration efforts in the 2A and 2B zones, which constitute the majority of the quarter-mile Merced River corridor in Yosemite Valley. Application of extensive 2A and 2B zoning throughout the majority of the Valley floor and opportunities for large-scale restoration of disturbed or developed areas to natural conditions that could result from this management zoning would provide a net long-term, major, beneficial effect on natural vegetation and the scenic quality of Yosemite Valley.

The scenic character of the entire river corridor (e.g., texture and lighting of the foreground of the landscape) could improve if the above actions were to occur and create opportunities for natural or directed revegetation. For example, the visual character of El Capitan Meadow is currently degraded by visitor use (trampling, soil compaction, and fragmentation). The current visitor-intensive use of El Capitan Meadow would be inconsistent with the 2A zoning, which is characterized by relatively undisturbed natural areas that receive only incidental or casual use. Application of the 2A management zoning and VERP could result in management actions that

would redirect use away from sensitive areas such as El Capitan Meadow and initiate restoration of the meadow. These management actions would have a local, long-term, minor, beneficial impact on the scenic quality of the meadow.

Application of the River Protection Overlay could have both beneficial and adverse effects on scenic resources within Yosemite Valley. Adverse effects on scenic resources could occur if implementation of the River Protection Overlay resulted in the removal of a historic bridge. This could adversely affect scenic resources within the Merced River corridor due to the loss of an aesthetically pleasing component of the scenic landscape. Beneficial effects on scenic resources from implementation of the River Protection Overlay could include removal of facilities (e.g., portions of Housekeeping Camp) that intrude upon the natural character of the corridor, which would increase opportunities for natural revegetation and restoration of the river corridor. The net effect of the River Protection Overlay would be a local, long-term, minor, beneficial impact on scenic resources, since the opportunities to increase natural vegetation and restoration of the river corridor would offset the adverse effects on scenic resources associated with possible removal of aesthetically pleasing historic bridges.

The intensity of potential impacts to scenic resources caused by Alternative 4 would be directly related to the effectiveness of methods employed in the park to reduce human-caused erosion within the river corridor and to reduce crowding at popular viewpoints. The VERP framework would monitor visitor use and its effects on scenic resources and scenic Outstandingly Remarkable Values. Facilities such as boardwalks and fences could be used to route people away from sensitive natural resources, while still permitting access to important viewpoints. Signs could be used to promote an understanding among park visitors of how to avoid harm to natural communities and features, though any physical facilities constructed to manage the impact of people on scenic resources should be designed for minimal disturbance of and visual intrusion into the natural landscape.

Scenic Outstandingly Remarkable Values within Yosemite Valley include views from the Merced River and its banks of waterfalls and water features (Nevada, Vernal, Illilouette, Yosemite, Sentinel, Ribbon, and Bridalveil Falls, and Silver Strand), rock cliffs (Half Dome, North Dome/Washington Column, Glacier Point, Yosemite Point/Lost Arrow Spire, Sentinel Rock, Three Brothers, Cathedral Rocks, and El Capitan), and meadows (Stoneman, Ahwahnee, Cook's, Sentinel, Leidig, El Capitan, and Bridalveil). There is a scenic interface of river, rock, meadow, and forest throughout the segment. Alternative 4 would protect and enhance the scenic Outstandingly Remarkable Values through the application of extensive 2A and 2B management zoning in the quarter-mile corridor in the Valley, the River Protection Overlay, and VERP. These management elements would place restrictions on new development and would encourage restoration activities. An example of a restoration activity that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leaved trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This would likely open views of scenic Outstandingly Remarkable Values from the Merced River corridor. Application of these management elements and implementation of VERP would have a local, long-term, moderate, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in the Merced River Gorge and El Portal. The majority of the Merced River gorge would have a quarter-mile boundary, be zoned 2A+, 2A, and 2B, and would receive increased protection over the absence of zoning under the No Action Alternative. Extensive use of 2A+, 2A, and 2B zoning in the gorge would substantially limit areas where new development could occur. Management zoning would ensure that the natural appearance of the gorge would be maintained, which would have a local, long-term, negligible, beneficial impact on scenic resources.

Scenic Outstandingly Remarkable Values of the Merced River gorge include views from the Merced River and its banks of the Cascades, spectacular rapids among giant boulders, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock. The extensive application of 2A+, 2A, and 2B zoning and the quarter-mile boundary over a majority of the Merced River gorge would protect and enhance these Outstandingly Remarkable Values. Management zoning in the gorge would substantially limit areas where new development could occur in the gorge and would maintain the natural appearance of the gorge, ensuring the protection of the scenic Outstandingly Remarkable Values.

Some developed areas of El Portal would be zoned 3C (e.g., Railroad Flat, Rancheria Flat, Old El Portal), which could allow limited additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site) in these areas. Such development could have local, long-term, minor, adverse effects on the scenic character of the Merced River corridor in El Portal. Adverse effects could be mitigated by implementing mitigation measures described in Chapter II under Mitigation Measures Common to All Action Alternatives. The adverse impact on scenic resources in El Portal could be further offset by the potential restoration of disturbed or developed land to natural conditions such as at the Trailer Village (zone 2B) and the sand pit (zone 2C). This would have a local, long-term, minor, beneficial effect on scenic resources at these locations. Overall, scenic resources in El Portal would experience a local, long-term, negligible, beneficial effect from the potential restoration of disturbed or developed land to natural conditions. This beneficial impact would be partially offset due to the limited development that could occur in El Portal under the 3C management zoning.

Impacts in the South Fork. The upper and lower portions of the South Fork would be zoned 1A, 1B, and 2A+. The majority of the South Fork through Wawona would be zoned 1A, 2A, 2B, and 3C. The 1A, 1B, 2A+, 2A, and 2B management zoning would increase protection over the absence of zoning under the No Action Alternative. Application of these zones along the South Fork would substantially limit areas within the quarter-mile Merced River corridor where new development could occur. The 1A, 1B, 2A+, 2A, and 2B management zones would ensure that the natural appearance of these areas of the South Fork would be maintained, which would have a local, long-term, minor, beneficial impact on scenic resources.

Some developments in Wawona would be inconsistent with the 2B management zoning (e.g., the Pioneer Yosemite History Center, Wawona maintenance area, and the Wawona picnic area) and could be removed from the corridor. The Pioneer Yosemite History Center has aesthetically pleasing qualities, and the potential removal of this facility from the corridor would have an adverse effect on scenic resources. The potential restoration of the Wawona maintenance facility would have a beneficial impact on scenic resources in Wawona, due to the restoration of this

developed area to natural conditions. Wawona picnic area is not a visually intrusive facility, but it does limit the potential for restoration in this area; if the picnic area were removed, scenic resources would be beneficially affected. Overall, potential removal of these facilities would have a local, long-term, minor, beneficial effect on scenic resources due to the potential for restoration of developed areas, although this beneficial impact would be somewhat offset by the potential loss of the aesthetically pleasing Pioneer Yosemite History Center.

Portions of features adjacent to the South Fork, such as Wawona Campground, would be inconsistent with the River Protection Overlay and could be removed or relocated, thereby increasing opportunities for natural revegetation and restoration. Should these areas within the River Protection Overlay be restored, this would have a local, long-term, minor, beneficial impact on scenic resources in these areas.

Scenic Outstandingly Remarkable Values of the South Fork include views from the Merced River and its banks of large pothole pools within slick rock cascades, old growth forest, and meadows, Wawona Dome, and continual white-water cascades in the deep and narrow river canyon below Wawona. Alternative 4 would protect and enhance the scenic Outstandingly Remarkable Values through the application of 1A, 1B, 2A+, 2A, and 2B management zoning along the South Fork, the River Protection Overlay, and VERP. These management elements would place restrictions on new development and would encourage restoration activities. Should VERP monitoring reveal degradation of riparian vegetation due to visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the resource and management zone. Such management elements would protect scenic Outstandingly Remarkable Values, including views from the river and its banks of unique features, and would have a local, long-term, minor, beneficial effect on scenic resources.

Summary of Alternative 4 Impacts. Generally, application of the management zoning and the River Protection Overlay, and VERP would have a local, long-term, moderate, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley, due to opportunities to restore degraded areas of the Merced River corridor, remove developments inconsistent with the River Protection Overlay, and to implement management actions to maintain desired resource conditions pursuant to VERP. In designated Wilderness, the impacts would be negligible and beneficial, because scenic resources in Wilderness areas would experience somewhat perceptible improvements compared to Alternative 1. In the gorge and El Portal, this alternative would have a negligible, beneficial impact on scenic resources by ensuring the natural appearance of the gorge would be maintained, and due to the potential for restoration in El Portal. In Wawona, impacts to scenic resources would be minor and beneficial.

Cumulative Impacts

Cumulative impacts to scenic resources discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect scenic resources within the river corridor or in the immediate park vicinity.

Past Actions. Scenic resources have been affected by numerous past actions since the inception of the park. Primary among these, when considered in relation to the potential effects of the

Merced River Plan, is the alteration of natural communities caused by Euro-American settlers who lived in the park. For example, attempts to establish agricultural activities and the development of tourism resulted in the drying out of the Valley by breaching the moraine and controlling naturally occurring fire, which affected vegetation patterns along the Merced River. Broad-leafed trees along the riverbanks were replaced by the comparatively dense stands of conifers that exist today. This has had a local, long-term, adverse effect on scenic resources, as the conifers now block views of important scenic resources that were viewable before the vegetation patterns were changed.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor, and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Projects that could have a cumulative beneficial effect on scenic resources include those that could reduce the number of vehicles entering the park and therefore the frequency of intrusion of vehicles into the scenic landscape. Projects that improve the general health of ecosystems viewable from or within the Merced River corridor also would result in a net cumulative, beneficial effect on scenic resources. Examples of these types of projects are:

- The Yosemite Area Regional Transportation System (YARTS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams, Dinkey Lakes, and Monarch Wildernesses (USFS)

The general goal of these projects is to either reduce private vehicle traffic in the park, and especially in Yosemite Valley (which would reduce the frequency of vehicles intruding into important scenic resources viewable within or from the Merced River corridor), or to improve the health of ecosystems that make up parts of important scenic resources, either in the park or on lands adjacent to the park. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and

trampling and restoring natural vegetation. These cumulative projects would have a net long-term, beneficial impact on scenic resources.

Reasonably foreseeable projects that could have an adverse effect on scenic resources include:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Yosemite View parcel land exchange, El Portal (NPS)

The local, long-term, adverse effects of these reasonably foreseeable projects would be related to the potential introduction of new structures and/or infrastructure that would intrude into views of important scenic resources within or viewable from the Merced River corridor. For example, the Yosemite View parcel land exchange could result in new development in an area of El Portal that is currently undeveloped and reduce the vegetative screening of the existing motel complex. This project would result in increased views of developed structures on the banks of the Merced River from Highway 140.

Reasonably foreseeable projects that could have a mixed effect on scenic resources include:

- The *Yosemite Valley Plan* (NPS)
- Wawona Campground Improvement (NPS)

The *Yosemite Valley Plan* would restore disturbed or developed land to natural conditions in the Valley, and would develop new areas of the Valley (predominantly in the east Valley), Wawona, and El Portal. However, it is acknowledged that some of the components of the *Yosemite Valley Plan* (for example, the redevelopment of Camp 6, Yosemite Lodge, and El Portal Trailer Village, and new development in Section 35 in Wawona), would not be compatible with the management zoning in Alternative 4. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and markedly reducing traffic congestion. The *Yosemite Valley Plan* would likely have beneficial impacts on scenic resources in the Valley due to planned actions associated with large-scale restoration. The *Yosemite Valley Plan* could have a local, long-term, beneficial or adverse effect on scenic resources in Yosemite Valley, El Portal, and Wawona, depending upon the specific actions recommended by the plan and the extent to which the actions prescribed in the *Yosemite Valley Plan* would restore disturbed areas to natural conditions or prescribe new development or redevelopment of these areas.

The Wawona Campground Improvement project would have a local, long-term, beneficial impact on scenic resources due to restoration activities to improve the existing degraded campground, including activities to revegetate the riverbanks. Some aspects of the campground improvement project could have adverse effects on scenic resources due to new development in undeveloped areas, such as the proposal to construct an additional campground in Section 35.

These past and reasonably foreseeable future actions could have a net local, long-term, minor, beneficial cumulative effect on scenic resources because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, and reducing the number of vehicles traveling through the park. This beneficial impact would be partially offset by adverse impacts associated with past alterations of natural communities and by new developments, such as the Yosemite View parcel land exchange in El Portal.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, moderate, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning and the River Protection Overlay in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial, because scenic resources in Wilderness areas would experience somewhat detectable improvements compared to Alternative 1. In the gorge and El Portal, Alternative 4 and the cumulative projects would result in local, long-term, negligible, beneficial impacts to scenic resources by ensuring the natural appearance of the gorge would be maintained, and due to the potential for restoration in El Portal. In Wawona, impacts to scenic resources would be minor and beneficial, due to opportunities for restoration pursuant to the management elements of Alternative 4 and the reduction in built facilities pursuant to the bridges replacement project.

Conclusions

Generally, application of management zoning, the River Protection Overlay, and VERP would have a local, long-term, moderate, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley due to opportunities to restore degraded areas of the Merced River corridor, remove developments inconsistent with the River Protection Overlay, and to implement management actions to maintain desired resource conditions pursuant to VERP. In designated Wilderness, the impacts would be negligible and beneficial, because scenic resources in Wilderness areas would experience somewhat perceptible improvements compared to Alternative 1. In the gorge and El Portal, this alternative would have a negligible, beneficial impact on scenic resources by ensuring the natural appearance of the gorge would be maintained, and due to the potential for restoration in El Portal. In Wawona, impacts to scenic resources would be minor and beneficial.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, moderate, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning and the River Protection Overlay in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial, because scenic resources in Wilderness areas would experience somewhat detectable improvements compared to Alternative 1. In the gorge and El Portal, Alternative 4 and the cumulative projects would result in local, long-term, negligible, beneficial impacts to scenic resources by ensuring the natural appearance of the gorge would be maintained, and due to the

potential for restoration in El Portal. In Wawona, impacts to scenic resources would be minor and beneficial due to opportunities for restoration pursuant to the management elements of Alternative 4 and the reduction in built facilities pursuant to the bridges replacement project.

Socioeconomics

Social Environment

Analysis

General Impacts. Under the application of management zones for Alternative 4, a number of employee residences could possibly be displaced in Yosemite Valley, Wawona, and El Portal. In Yosemite Valley, the Valley stable and primary park concession employee residences at the Valley stable would be inconsistent with the 2B zoning prescription and could be removed from the park. If the Valley stable were removed from the park, the stable would no longer operate; these employee residences would no longer be needed and would not be replaced elsewhere in the park or in the El Portal Administrative Site. Under Alternative 4, the Yellow Pine Campground would be zoned 2A and could be removed from the park; if it were removed, there would be a net loss of volunteer camping in the Valley. The loss of volunteer camping at Yellow Pine would have a long-term, negligible, adverse impact on the local social environment of Yosemite Valley due to a reduction in volunteer housing in the Valley.

In Section 35 in Wawona, a number of park-owned residences are located within the Merced River corridor and River Protection Overlay and would be inconsistent with the 2B zoning prescription and the River Protection Overlay applied to that area. Under Alternative 4, these employee residences could be removed, resulting in the displacement of the residents.

Under Alternative 4, the El Portal Trailer Village would be inconsistent with the 2B zoning prescription and could be removed. The National Park Service and concessioner residences at the El Portal Trailer Village could be replaced within a 3C zone or outside of the river corridor in El Portal.

Generally, development of replacement employee housing in El Portal would not be consistent with the predominantly 2C management zoning in this area under Alternative 4. However, limited areas are available within the 3C zones or in El Portal where employee housing could be developed. Although it is unknown where the displaced employee housing would be relocated, some or all of the housing units could be located in El Portal. The social environment in El Portal would experience long-term, minor, adverse impacts associated with the removal of housing in El Portal (although some of the housing could be rebuilt in El Portal) and there would be impacts on community amenities from relocation of displaced employee housing to El Portal.

Employee commuting distances and costs would increase if employee housing were relocated out of Wawona. Wawona employees would experience an approximately two-hour, round-trip commute each day from El Portal.

The removal and potential relocation of employee housing and associated effects on employee commutes would be a long-term, minor, adverse impact on the local social environment of

Wawona. In Wawona, approximately 10% of National Park Service housing could be relocated to El Portal. Eligible residents who might be effected by actions of this plan, and who meet the compensation criteria under provisions of the Uniform Relocation Act, may be eligible for housing and moving benefits, although this would not be expected to lower the intensity of the impact.

Summary of Alternative 4 Impacts. The loss of volunteer camping at Yellow Pine would have a long-term, negligible, adverse impact on the local social environment of Yosemite Valley due to a reduction in volunteer housing in the Valley. The social environments in El Portal and Wawona would experience long-term, minor, adverse impacts associated the removal of housing in El Portal and Wawona (although some of the housing could be rebuilt in El Portal), associated effects on employee commutes, and there would be limited impacts on community amenities from the potential relocation of displaced employee housing to El Portal.

Cumulative Impacts. Cumulative effects on the social environment discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to this environmental discipline.

Past Actions. A substantial number of concession beds were damaged by the 1997 flood and were subsequently removed. The majority of the removed concession beds were replaced with temporary beds for concession employees, although not all of the beds were replaced, which resulted in a net loss of concessioner housing in Yosemite Valley. The loss of housing and the replacement of permanent housing with temporary housing has had a local, long-term, adverse effect on the social environment of Yosemite Valley.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the social environment include:

- Yosemite Area Regional Transportation System (YARTS)
- Merced River Canyon Trail Acquisition (BLM)

Implementation of YARTS would provide additional transportation options for employees and community residents. YARTS could somewhat improve the commuting conditions of employees by providing regional transportation alternatives for those employees resulting in a regional, long-term, beneficial impact on employee commutes.

The Bureau of Land Management's Merced River Canyon Trail Acquisition would allow for the development of a recreational trail west of the El Portal Administrative Site. This project would somewhat improve community amenities in El Portal, resulting in a local, long-term, beneficial impact on the social environment of El Portal.

A reasonably foreseeable future project that could have an adverse effect on the social environment includes:

- The Yosemite View parcel land exchange, El Portal (NPS)

The Yosemite View parcel land exchange would somewhat reduce the amount of open space available to the community of El Portal, although the proposed motel development would incorporate a public trail system and limited nature/river interpretive areas. This project would result in a local, long-term, adverse impact to the social environment of El Portal. This would result from the strain on limited community amenities in El Portal, loss of open space, and the opportunity cost of removing the National Park Service Parkline land from consideration for other community needs.

A reasonably foreseeable future project that could have a mixed effect on the social environment includes:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would remove substantial amounts of employee housing from Yosemite Valley, and would construct new employee housing in El Portal and Wawona, among other locations. However, it is acknowledged that some of the proposed redevelopment in El Portal, for example, the redevelopment of the El Portal Trailer Village, would not be compatible with the management zoning in Alternative 4 of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The National Park Service would continue to strive to remove employee housing and administrative functions from Yosemite Valley, and relocate such functions to the El Portal Administrative Site, which was established by Congress for such purposes. The *Yosemite Valley Plan* could have a local, long-term, beneficial or adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona, depending upon the specific actions recommended by the plan and whether the structure of the communities (e.g., overall numbers of residences, adequacy of community amenities) would be affected.

The cumulative projects would have a regional, long-term, negligible, beneficial impact on employee commuting conditions due to the provision of regional transportation alternatives. The cumulative projects would have a local, long-term, minor, adverse effect on the social environments of Yosemite Valley and El Portal due to past loss of employee housing in Yosemite Valley and a reduction in the amount of open space in El Portal due to the land exchange, although this would be somewhat offset by the trail acquisition project.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residences could be relocated under Alternative 4 by

providing regional transportation alternatives for those employees. Alternative 4 and the cumulative projects would have a local, long-term, minor, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing in Yosemite Valley and Wawona, increases in commuting time for Wawona residents, and a potential increase in housing in El Portal (resulting in a strain on the limited community amenities of El Portal).

Conclusions. The loss of volunteer camping at Yellow Pine would have a long-term, negligible, adverse impact on the local social environment of Yosemite Valley due to a reduction in volunteer housing in the Valley. The social environments in El Portal and Wawona would experience long-term, minor, adverse impacts associated with the removal of housing in El Portal and Wawona (although some of the housing could be rebuilt in El Portal), associated effects on employee commutes, and there would be limited impacts on community amenities from the potential relocation of displaced employee housing to El Portal.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residences could be relocated under Alternative 4 by providing regional transportation alternatives for those employees. Alternative 4 and the cumulative projects would have a local, long-term, minor, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing in Yosemite Valley and Wawona, increases in commuting time for Wawona residents, and a potential increase in housing in El Portal (resulting in a strain on the limited community amenities of El Portal).

Visitor Populations

Analysis

General Impacts. Under the application of management zones for Alternative 4, application of the management zoning prescriptions in the quarter-mile Merced River corridor boundary would limit the availability of space in Yosemite Valley for concentrated areas of day-visitor parking, park accommodations, and high-intensity visitor recreation areas. As a result, it is assumed that annual visitation demand would not be accommodated in the Valley under Alternative 4, and some visitors could be displaced to other areas of the park or displaced from the park itself.

Under Alternative 4, a substantial number of Yosemite Lodge units and all Housekeeping Camp units would be located in an incompatible 2B zone. The North Pines Campground, approximately half of the existing campsites in Lower Pines Campground, and about one-third of the campsites at Wawona Campground would be located in an incompatible 2B zone or the River Protection Overlay. The Wawona Horse Camp would be located in an incompatible 3C zone. Under Alternative 4, these facilities could be removed from the park. Relocation of these facilities outside of the corridor would not likely be feasible, since most areas that could be developed in Yosemite Valley and Wawona would be within the quarter-mile corridor.

Based on the management zoning prescriptions under Alternative 4, the number of overnight accommodations in the park could be reduced from the in-park accommodation levels in

Alternative 1. A decrease in these facilities would reduce the number of park overnighers accommodated in the park. Under Alternative 4, the absence of a transit center or substantial concentrated day-visitor parking areas in the Valley and the broad application of low-intensity management zoning prescriptions (such as 2A and 2B zones) within a quarter-mile boundary of the river would substantially limit the number of day visitors accommodated in the Valley. Collectively, the reduction in the number of visitors accommodated in the Valley under Alternative 4 could be substantial, and these visitors could be displaced to other areas of the park or displaced from the park itself. The permanent decrease in overnight accommodations and the potential displacement of day visitors from the Valley and possibly the park would constitute a long-term, major, adverse impact on overnight and day visitors.

Substantial reductions in the number of park overnighers and day visitors accommodated at the park would result in a proportionate reduction in Yosemite visitor spending. Impacts to the regional economy associated with changes in visitor spending are discussed below under the heading “Regional Economy.”

Impacts on Low-Income Populations. Potential impacts on low-income populations that visit the park are related primarily to the availability and cost of overnight accommodations, and the range of available low-cost recreation activities. Low-income populations are currently underrepresented in the park compared to the state as a whole, and compared to the five counties surrounding the park. However, no information is available to precisely identify the visitation patterns of low-income visitors, such as where they stay and what activities they enjoy in the park. Therefore, the potential impact of a change in lodging or recreation opportunities on low-income populations cannot be quantified.

In the absence of precise data, this analysis assumes that low-income visitors favor lower-cost accommodations, such as camping or lodging at Housekeeping Camp, and inexpensive day-use activities such as swimming, wading, or hiking. Alternative 4 would likely have long-term, minor, adverse effects on the availability of inexpensive activities (by, for example, placing limitations on formal picnicking facilities in 2A and 2B zones in the Merced River corridor). Alternative 4 could result in a decrease in the total number of campsites and the removal of Housekeeping Camp, which would likely result in a long-term, moderate, adverse impact on low-income visitors. Low-income visitors displaced from the park because of a lack of access to low-cost accommodations could choose to stay in relatively inexpensive lodging facilities outside the park, such as campgrounds run by the U.S. Forest Service. However, the additional expense of traveling to and from the park would likely cause some low-income visitors to shorten their visit to the park, or avoid it altogether. Therefore, Alternative 4 could result in a decrease in the total number of low-income visitors to the park.

Summary of Alternative 4 Impacts. Under Alternative 4, the number of Yosemite visitors able to be accommodated would be reduced. The permanent decrease in park overnight accommodations and the potential displacement of day visitors from the Valley and possibly the park would constitute a long-term, major, adverse impact on overnight and day visitors.

Alternative 4 would likely have an adverse effect on low-income populations due to reduced availability of inexpensive activities and a decrease in the total number of campsites and loss of

Housekeeping Camp units. This would have a long-term, moderate, adverse impact on low-income visitors.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the visitor populations.

Past Actions. Upper and Lower River Campgrounds were damaged by the 1997 flood and have been closed to visitors. In addition, a substantial number of units at the Yosemite Lodge were damaged during the flood, and have been removed. Closure of these campgrounds and lodging units reduced the number of in-park camping accommodations available in Yosemite National Park, further exacerbating unmet demand for accommodations in the park. Closure of these facilities has had a local, long-term, adverse effect on park overnights, due to the clearly detectable reduction in park accommodations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have a net adverse effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the visitor population include:

- Yosemite Area Regional Transportation System (YARTS)
- Wawona Campground Improvement (NPS)

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley when the Restricted Access Plan were implemented. It is anticipated that the regional, long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

The Wawona Campground Improvement project would improve the existing camping facilities at Wawona Campground and would construct additional campground facilities in Section 35 in Wawona. This project would have a local, long-term, beneficial impact on the visitor population by increasing the number of campsites in the park.

A reasonably foreseeable future project that could have a net adverse effect on the visitor population includes:

- The *Yosemite Valley Plan* (NPS)

Overall, the *Yosemite Valley Plan* would substantially reduce the number of lodging facilities and nominally reduce the number of campsites in Yosemite Valley, although this plan would increase the number of lodging units at Yosemite Lodge. However, it is acknowledged that some of the components of the *Yosemite Valley Plan*, for example, the expansion of a portion of Yosemite Lodge and the development of Camp 6, would not be compatible with the management zoning in Alternative 4 of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the

Yosemite Valley Plan. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* would likely have a local, long-term, adverse impact on the visitor population due to a likely reduction in the number of overnight accommodations in the Valley.

The cumulative projects would have a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Given the reduction in the number of lodging and camping units from the 1997 flood and the potential reduction in overnight accommodations due to the *Yosemite Valley Plan*, these cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to decreased opportunities to lodge and camp in the Valley, although this would be somewhat offset by increased camping opportunities in Wawona.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 4 and the cumulative projects would have a local, long-term, major, adverse impact on the visitor population, including low-income visitors, due to a past reduction of accommodations in Yosemite Valley, the potential reduction in overnight accommodations due to the *Yosemite Valley Plan*, and a decrease in park overnight accommodations and the potential displacement of day visitors from Yosemite Valley and possibly the park under Alternative 4.

Conclusions. Under Alternative 4, the number of Yosemite visitors able to be accommodated would be reduced. The permanent decrease in park overnight accommodations and the potential displacement of day visitors from the Valley and possibly the park would constitute a long-term, major, adverse impact on overnight and day visitors.

Alternative 4 would likely have an adverse effect on low-income populations due to reduced availability of inexpensive activities and a decrease in the total number of campsites and loss of Housekeeping Camp units. This would have a long-term, moderate, adverse impact on low-income visitors.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 4 and the cumulative projects would have a local, long-term, major, adverse impact on the visitor population, including low-income visitors, due to a past reduction of accommodations in Yosemite Valley, the potential reduction in overnight accommodations due to

the *Yosemite Valley Plan*, and a decrease in park overnight accommodations and the potential displacement of day visitors from Yosemite Valley and possibly the park under Alternative 4.

Regional Economy

Analysis

General Impacts. As stated in the discussion of Visitor Populations, the number of Yosemite visitors able to be accommodated would be reduced under Alternative 4. Potential substantial reductions in the number of park overnighers and day users that could be accommodated at the park would result in a proportionate reduction in Yosemite visitor spending in the affected region. This would constitute a long-term, minor, adverse impact on the regional socioeconomic environment. The reduction in visitor spending would be slightly detectable and could have a minor effect on the character of the region. Decreased Yosemite visitor spending would result in minor decreases in output, income, and employment in the gateway region.

Implementation of Alternative 4 could result in limited construction activity, predominantly associated with restoration activities and the removal of facilities from the river corridor. Although the magnitude of the construction activity is not quantifiable, the activity would generate construction-related output, employment, and income in the regional economy. This would have a short-term, negligible, beneficial impact on the regional economy, due to the temporary nature of construction activity and the expected small magnitude of the construction activity compared with the size of the construction industry in the affected region.

Summary of Alternative 4 Impacts. Under Alternative 4, potential substantial reductions in the number of visitors that would be accommodated at the park would result in a proportionate reduction in Yosemite visitor spending in the affected region. This would constitute a long-term, minor, adverse impact on the regional socioeconomic environment.

Implementation of Alternative 4 could result in limited construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the regional economy.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have a net mixed effect.

Reasonably foreseeable future projects that could have a cumulative beneficial effect on the regional economy include:

- Yosemite Area Regional Transportation System (YARTS)
- Development-related projects, such as Yosemite West Rezoning Application (NPS), Hazel Green Ranch (Mariposa Co.), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort, June Lake (Mono Co.), Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge

Expansion (Tuolumne Co.), Hardin Flat Lodging and Conference Facilities (Tuolumne Co.), Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.), Silvertip Resort Village Project (Mariposa Co.)

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley if the Restricted Access Plan were implemented. It is anticipated that the long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

Several new lodging facilities are planned in the affected region, including tent cabins and hard-sided cabins at Hazel Green Ranch outside the park near the Big Oak Flat Entrance Station (Mariposa Co.), a hotel complex as part of the Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort in June Lake, Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge expansion near Camp Mather, a hotel in Hardin Flat, a motel and restaurant in Second Garrotte Basin (Tuolumne Co.), and the Silver Tip Resort Village Project in Fish Camp. Development of these facilities would expand the overnight lodging capacity of the gateway region. By providing local construction spending and employment during development, increasing lodging revenues and transient occupancy taxes, and providing sources of income and employment for area residents, these facilities would have a long-term, beneficial effect on the regional economy. The development of these facilities would increase demand for government services, including police, fire, and other services; it would be expected, however, that local government taxes assessed for these facilities would offset the incremental costs associated with providing such services.

A reasonably foreseeable future project that could have a cumulative mixed effect on the regional economy includes:

- *The Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would generate project construction spending and employment associated with implementation of the alternative, although it would also result in a decrease in in-park accommodations (and its associated visitor spending). However, it is acknowledged that some of the components of the Yosemite Valley Plan, for example, the expansion of a portion of Yosemite Lodge, and redevelopment of Camp 6 and the El Portal Trailer Village, would not be compatible with the management zoning in Alternative 4 of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* could have a local, long-term, beneficial or adverse effect on the regional economy, depending upon the specific actions recommended by the plan and whether the increased regional output and employment from expanded National Park Service in-park operations would be offset by the potential decrease in in-park accommodations (and its associated visitor spending).

These cumulative projects would have a short-term, minor, beneficial effect on the regional economy due to project construction spending and employment associated with implementation of the out-of-park lodging facilities. The cumulative projects would have a long-term, minor, beneficial effect on the regional economy due to increased access for day visitors to the park, increased lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the projects. Alternative 4 and the cumulative projects would result in a long-term, negligible, adverse impact on the regional economy due to potential substantial reductions in the number of visitors that would be accommodated at the park and the resulting proportionate reduction in Yosemite visitor spending in the affected region associated with Alternative 4. The adverse impacts associated with Alternative 4 would be somewhat offset by increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Conclusions. Under Alternative 4, potential substantial reductions in the number of visitors that would be accommodated at the park would result in a proportionate reduction in Yosemite visitor spending in the affected region. This would constitute a long-term, minor, adverse impact on the regional socioeconomic environment.

Implementation of Alternative 4 could result in limited construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the projects. Alternative 4 and the cumulative projects would result in a long-term, negligible, adverse impact on the regional economy due to potential substantial reductions in the number of visitors that would be accommodated at the park and the resulting proportionate reduction in Yosemite visitor spending in the affected region associated with Alternative 4. The adverse impacts associated with Alternative 4 would be somewhat offset by increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Concessioner

Analysis

General Impacts. Under the application of management zones for Alternative 4, there would be a reduction in number of Yosemite visitors able to be accommodated, which would adversely impact the revenues of the primary park concessioner. In addition, several facilities operated by the concessioner would be inconsistent with the management zone prescriptions and could potentially be removed. A substantial number of Yosemite Lodge units, all Housekeeping Camp units, the Yosemite Valley stable, and Wawona stable would be located in an incompatible 2B

zone. Conservatively assuming that Alternative 4 could result in the discontinuation of over one-third of visitor lodging at Yosemite Lodge, all visitor lodging at Housekeeping Camp, and could remove the Valley stable and Wawona stable, this alternative would have an adverse impact on concession revenues. In addition, the potential reduction in campsites would result in loss of concessioner revenues associated with camper spending on food, beverages, and sundries, which would adversely affect concessioner revenues.

Under the current concession contract, a greater than 2% change in concession revenues would constitute a major impact for the primary park concessioner because of the high fixed costs experienced by the concessioner. This threshold provides a reasonable opportunity for net profit for the primary park concessioner in relation to capital invested and the obligations of the contract, as required by the National Park Service Concessions Management Improvement Act of 1998. Conservatively assuming the removal of all park concessioner facilities that would be inconsistent with the management zones, this alternative would decrease annual revenues (based on 1998 data) by more than 12%. This would constitute a short-term, major, adverse impact on concession operations. In addition, day-visitor spending would be substantially reduced due to a reduction in the number of day visitors able to be accommodated in Yosemite Valley under Alternative 4. The overall impact would be short term because it would extend through the period of the current park concession contract, which expires in 2008, after which a new contract would be negotiated. In the long-term, the impacts to the park concessioner would be unknown because the terms of the future contract are unknown.

Summary of Alternative 4 Impacts. Under Alternative 4, the reduction in the number of Yosemite visitors accommodated under this alternative and the potential removal of several primary park concession facilities would constitute a short-term, major, adverse impact to the primary park concession operations.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to concessioner operations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net adverse effect; and (2) projects anticipated to have a net mixed effect.

A reasonably foreseeable future action proposed in the region that could have an adverse effect on the concessioner includes:

- Update to the *Yosemite Wilderness Management Plan* (NPS)

The update to the *Yosemite Wilderness Management Plan* (NPS) could restrict visitor use of the Merced Lake High Sierra Camp, resulting in closure of the camp to overnight lodging and a loss of revenues to the concessioner associated with providing overnight lodging services. The cumulative effect of the potential closure of Merced Lake High Sierra Camp would be a local, long-term, adverse impact on primary park concessioner revenues.

A reasonably foreseeable future action proposed in the region that could have a mixed effect on the concessioner includes:

- *The Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* proposes changes to park facilities, including expanding Yosemite Lodge and relocating employee housing outside the Valley. However, it is acknowledged that some of the components of the Yosemite Valley Plan, for example, the redevelopment of the El Portal Trailer Village and expansion of Yosemite Lodge, would not be compatible with the management zoning in Alternative 4 of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor in subsequent implementation plans, such as the *Yosemite Valley Plan*. If Alternative 4 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. Although components of the *Yosemite Valley Plan* would need to change to conform with Alternative 4, the broad goals of the *Yosemite Valley Plan* would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. The *Yosemite Valley Plan* could have a local, long-term, beneficial or adverse effect on the primary park concessioner, depending upon the specific actions recommended by the plan and the extent to which these actions would affect the facilities operated by the concessioner.

The cumulative projects would have a local, long-term, negligible, adverse impact on the primary park concessioner associated with the possible closure of the Merced Lake High Sierra Camp to overnight lodging, and a loss of revenues to the concessioner associated with providing overnight lodging services.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in short-term, major, adverse impacts associated with the reduction in the number of Yosemite visitors accommodated under this alternative, the possible removal of facilities in Alternative 4 of the *Merced River Plan/FEIS*, and the possible closure of the Merced Lake High Sierra Camp to overnight lodging. The impact would be short-term because it would extend through the period of the current park concession contract. In the long-term, impacts to the park concessioner are unknown, because the terms of the future contract are unknown.

Conclusions. Under Alternative 4, the reduction in the number of Yosemite visitors accommodated under this alternative and the potential removal of several primary park concession facilities would constitute a short-term, major, adverse impact to the primary park concession operations.

Alternative 4 and the cumulative projects within and in the vicinity of Yosemite National Park would result in short-term, major, adverse impacts associated with the reduction in the number of Yosemite visitors accommodated under this alternative, the possible removal of facilities in Alternative 4 of the *Merced River Plan/FEIS*, and the possible closure of the Merced Lake High Sierra Camp to overnight lodging. The impact would be short-term because it would extend through the period of the current park concession contract. In the long-term, impacts to the park concessioner are unknown, because the terms of the future contract are unknown.

Park Operations and Facilities

Analysis

The following discussion provides an overview of the types of impacts to park operations and facilities that could occur within each segment of the Merced River corridor from implementation of Alternative 4.

Impacts in Wilderness. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, and 1C, except at existing facilities where the zoning would be 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning is not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative. Consequently, the application of zoning within wilderness segments would have no effect on park operations or facilities. Development (short-term impacts) and implementation (long-term impacts) of the VERP framework for wilderness segments of the main stem and South Fork of the Merced River would require additional staff commitments, resulting in minor to moderate, adverse impacts on park operations (primarily resources management, interpretation, and protection staff).

Impacts in Yosemite Valley. The proposed zoning of Yosemite Valley in combination with the VERP framework could alter facilities, management of visitors, and restoration activities within the Merced River corridor and could increase demand on park staff and facilities. A number of existing facilities (e.g., campsites at North Pines Campground, Housekeeping Camp, the concessioner stable) would be inconsistent with the proposed 2B zone for east Yosemite Valley and 2A zone for west Yosemite Valley and could be removed. Facility removal would increase demands on staff in the short term during planning, demolition, and restoration. The need for additional services (e.g., protection) could also increase immediately following facility removal, while park visitors become accustomed to the new setting. Although short-term demands on park operations and facilities would increase (a short-term, moderate, adverse impact), long-term maintenance requirements would decrease (a long-term, moderate, beneficial effect on maintenance operations).

Application of proposed management zoning and the River Protection Overlay under this alternative could decrease overnight accommodations in Yosemite Valley (campsites or structured lodging) over the long term compared to the No Action Alternative. Removed facilities would be precluded at other locations within the river corridor but could be relocated to unspecified locations elsewhere in the park, or not at all. If overnight accommodation facilities were removed from the river corridor and not relocated elsewhere in the park, then the number of park overnights would likely decrease and the number of day visitors, or more precisely, “local overnights,” would increase proportionally. Because there would be no reduction in the total number of visitors, demands on park staff would not decrease (compared to the No Action Alternative), but are expected to be redirected to other divisions. For example, reduction in the total number of overnight accommodations could reduce demand for maintenance and protection services at Valley campgrounds and lodging facilities, but could increase demand for

interpretation, resource restoration, and road maintenance (e.g., visitors would need to make two trips per day between their out-of-park accommodations and park attractions, which could have a long-term, negligible to minor, adverse impact on park operations related to road maintenance).

Development of a transit center and/or day-visitor parking facility at Camp 6 or Taft Toe in Yosemite Valley would be precluded because of incompatible management zoning prescriptions. Parking spaces inconsistent with the 2A and 2B zones could be removed from the Merced River corridor. If those spaces were removed (and assuming no decrease in visitation), then demand for road maintenance, protection, and resources (restoration) staff could increase, as visitors unable to find an authorized place to park could circle the Valley (increasing road wear) or could decide to park in unauthorized/improper areas (increasing the need for protection and restoration). This would have a long-term, minor, adverse impact on park operations in Yosemite Valley.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have short- and long-term, major, adverse impacts on park operations and facilities because visitor use is relatively high (is expected to remain consistent or increase), access throughout the Valley is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. For example, if El Capitan Meadow (zone 2A) were managed to the desired condition (e.g., high-quality meadow habitat with low visitor encounters), demand on park operations (primarily protection and resources staff) would dramatically increase related to meadow restoration, patrolling (to discourage informal use of the meadow and informal parking), and direction of visitors to more appropriate areas. This effect would be most pronounced during initial application of VERP management actions, while park visitors became accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a major, long-term, adverse impact on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Overall, current visitor demand in Yosemite Valley could not be sustained under Alternative 4, and visitors would be displaced out of the Valley, either to other areas of the park or to areas outside of the park. In the short term, demands on staff would increase during planning, demolition, and restoration. Additional services (e.g., protection) could also increase immediately following facility removal, while park visitors became accustomed to the new setting and were directed away from Yosemite Valley. Although short-term demands on park operations and facilities would increase (a short-term, moderate, adverse impact), long-term maintenance requirements within the Valley could decrease (a long-term, moderate, beneficial effect on maintenance operations). As visitors were directed away from Yosemite Valley, out-of-Valley areas (e.g., El Portal, Wawona) could expect increased visitor use and visitor use-related impacts.

Impacts in the Merced River Gorge and El Portal. The majority of the gorge would be zoned (2A, 2A+, and 2B) consistent with existing conditions. The proposed zoning is relatively compatible (i.e., would not inherently set up management conflicts), and managing the gorge to its desired conditions would be uncomplicated. In addition, large portions of the gorge are relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on park operations and facilities for the gorge compared to the No Action Alternative.

Potential future actions (e.g., removal of Cascades Diversion Dam), or new or rehabilitated facilities (e.g., restrooms, roads) could occur consistent with the proposed management zoning and River Protection Overlay. If implemented, these future actions could create short-term, moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction/demolition. Because these potential actions would be implemented to protect resources (e.g., road repair could reduce erosion and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor to moderate and beneficial.

Application of the proposed Day Use (zone 2C), Discovery (zone 2B), and Park Operations and Administration (zone 3C) zones in El Portal could decrease, increase, or have no net effect on development within El Portal compared to the No Action Alternative. An example of decreased operations is the application of the 2C zoning at the Sand Pit (currently used for construction staging and other administrative purposes). The current use of the Sand Pit would be inconsistent with the proposed 2C zoning and could be removed. Removal of facilities such as the Sand Pit would increase staff requirements in the short term (related to removal), but could decrease staff requirements over the long term (related to facility maintenance).

A similar situation would occur with the 2B zoning at the Trailer Village. The development would be inconsistent with the proposed zoning and could be removed. This could have short-term, adverse effects on park operations during planning, removal, and restoration, with a long-term, beneficial effect because maintenance of structures, utilities, etc. would be reduced. Because the management zoning does not specify specific actions, there would be no effect on development within El Portal and no impact on park operations and facilities compared to Alternative 1. Alternatively, if the 3C zones at Railroad Flat and Old El Portal were fully built out or redeveloped, the demand on park operations and facilities would increase for El Portal compared to the No Action Alternative. In the short term, resource, planning, and facility staff would be required to accommodate construction of new facilities (short-term, moderate, adverse impact). Over the long term, demand on protection and maintenance staff would increase proportional to development, resulting in a long-term, moderate, adverse impact on park operations and facilities.

Visitation to the gorge and El Portal could increase as a result of decreased parking, lodging, and other facilities within Yosemite Valley. If use of the gorge and El Portal increased, it is reasonable to assume that demand for parking, interpretation, and recreational opportunities would increase proportionally. As the demand for parking increases, use of existing parking facilities as well as unauthorized/improper areas would increase. Increased use of either would increase the need for maintenance. Increased parking in unauthorized/improper areas also could decrease visitor safety (e.g., parking at unauthorized locations along El Portal Road could increase vehicle accidents and vehicle-visitor conflicts) and degrade natural areas (e.g., directly as a result of parking on natural vegetation, indirectly by the creation of informal trails from unauthorized/improper parking areas to park destinations). These in turn would increase demand on protection (enforcement), maintenance, and resource (restoration) services. The effects on park operations and facilities would be directly related to the change in visitation within the gorge and El Portal and could result in long-term, minor to major, adverse effects. These impacts would be concentrated in areas of relatively easy access (e.g., along the El Portal Road). A majority of the

gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on park operations and facilities at these locations.

Development of the VERP framework and its implementation within the gorge and El Portal is considered to have only minor, adverse impacts on park operations and facilities, because visitor use is relatively low and is expected to remain relatively low due to access and topography constraints.

Impacts in Wawona. The majority of Wawona would be zoned consistent with existing conditions and would have no net effect on park operations or facilities compared to Alternative 1. Portions of existing facilities, such as Wawona Campground, Wawona Picnic Area, Wawona maintenance yard, and the Pioneer Yosemite History Center, would be inconsistent with the proposed management zoning and/or River Protection Overlay and could be removed. Demand for park operations, facilities, and resource staff would likely increase in the short term during removal (short-term, minor to moderate, adverse impact). However, the long-term effect of removal or relocation is considered only negligible to minor and adverse, because these facilities could be relocated elsewhere outside the corridor.

Potential future actions (e.g., removal or replacement of Wawona Bridge, construction of new restrooms) could occur consistent with the proposed management zoning and River Protection Overlay. If implemented, these future actions could create short-term, minor to moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction/demolition. Because these potential future actions would be implemented to protect resources (e.g., bridge replacement to restore the free flow of the river and decrease erosion, scour, and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor to moderate and beneficial.

Visitation to Wawona could increase as a result of decreased parking, lodging, and other facilities within Yosemite Valley. If use of Wawona increased, it is reasonable to assume that demand for parking, interpretation, and recreational opportunities would increase proportionally. The effects on park operations and facilities would be directly related to the change in visitation within Wawona and could result in long-term, minor to major, adverse effects.

Development of the VERP framework and its implementation within Wawona under Alternative 4 is considered to have only minor, adverse impacts (both short-term and long-term) on park operations and facilities, because visitor use is relatively low (and dramatic change in visitor use patterns for Wawona under this alternative is considered speculative) and because the proposed management zoning is designed to facilitate implementation of the VERP framework over the long term (e.g., the zoning is relatively compatible and would not inherently set up management conflicts between zones).

Summary of Alternative 4 Impacts. In total, application of management zoning and the River Protection Overlay, in combination with development and implementation of the VERP framework would substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by the increased need for research, planning, and monitoring to establish scientifically based indicators, standards, and monitoring

protocols for the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones and the River Protection Overlay to their desired conditions would further increase demand on park staff and resources. Overall, implementation of VERP, in combination with other management elements proposed under Alternative 4, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Short-term, adverse impacts would be most pronounced in Yosemite Valley, El Portal, and Wawona. Over the long term, decreased visitation and use of Yosemite Valley and a total reduction in the number of facilities would have a minor to moderate, beneficial effect on park operations and facilities. Visitation of Wawona, the gorge, and El Portal could increase if visitors were displaced from Yosemite Valley. The effects on park operations and facilities would be directly related to the change in visitation and could result in long-term, minor to major, adverse effects.

Cumulative Impacts

Cumulative effects on park operations and facilities discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the immediate Yosemite region in combination with potential effects of this alternative. The extent to which past, present, or reasonably foreseeable projects could have a cumulative effect, when combined with other actions that could result under present National Park Service management strategies, is determined largely by whether such projects would affect demand for park operations services and facilities. For example, effects of projects that change the number of vehicles traveling through the park could combine with effects of the *Merced River Plan* to either increase or decrease the need for maintenance activities on roads and bridges. Similarly, projects that affect demand for other park operations services and facilities could also have a cumulative effect. These services include maintenance of utility systems, provision of interpretation programs, visitor protection, and resource management.

Past Actions. Park operations and facilities have been affected by numerous past National Park Service management decisions made since the inception of the park. Primary among those, when considered in relation to the potential effects of the *Merced River Plan*, include relocating the National Park Service maintenance shops and warehouse to El Portal (mostly adverse), removal of the hydroelectric generating plant (mostly adverse), professionalization of law enforcement staff (mostly adverse), rehabilitation of the water and electric distribution systems (mostly beneficial), improved communication systems (cell phones and radios, mostly beneficial), relocating the National Park Service wastewater treatment facility from Yosemite Valley to El Portal (mostly beneficial), and implementation of the prescribed fire program (adverse and beneficial). Overall, there is no net adverse or beneficial effect of these past actions on park operations and facilities.

Present Actions. Present actions that affect park operations and facilities include planning related to the *Yosemite Valley Plan* (NPS) and the El Portal Road Reconstruction Project (NPS). The *Yosemite Valley Plan* has substantially increased demand on resource, facility, and planning staff. The El Portal Road Reconstruction Project (NPS) is currently underway and affects park operations and facilities because the reconstruction is placing some increased demand on park operations staff.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Projects that could have a cumulative, beneficial effect on park operations and facilities include those that could reduce the number of visitors entering the park, reduce the number or amount of facilities within the park, or reduce long-term maintenance activities. Examples of these types of projects include:

- Transportation projects including the Yosemite Valley Shuttle Bus Stop Improvements (NPS), South Fork Merced River Bridges Replacement (NPS), and Evergreen Road Improvements (multi-agency, see Appendix G)
- Several Yosemite utility projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line , Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, and Hodgdon Meadows Water and Wastewater Treatment Improvements (NPS), and O’Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Planning efforts, including the South Entrance/Mariposa Grove Site Planning (NPS), update to the *Yosemite Fire Management Plan* (NPS), update to the *Yosemite Wilderness Management Plan* (NPS), and *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

Although each of the aforementioned projects could have short-term, adverse effects associated with planning, construction, replacement, or rehabilitation, the general goal of each of these projects is to reduce long-term maintenance. Therefore, these projects could have a long-term, beneficial, cumulative impact on park operations and facilities.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on park operations and facilities include:

- The Yosemite Area Regional Transportation System (YARTS), which has a goal of increasing transportation options and reducing reliance on automobiles in the area
- Planned rehabilitation of Tamarack Campground, Yosemite Creek Campground, Hodgdon Meadow Campground, Wawona Campground Improvement, and Bridalveil Horse Camp (NPS)
- Development-related projects such as Yosemite West Rezoning Application (NPS); Crane Flat Campus Redevelopment (NPS, YNI); Tuolumne Meadows Development Concept Plan (NPS); Resource Management Building (NPS); Expansion of Mariposa County Transit System (Mariposa Co.); and University of California, Merced Campus (Merced Co.)

Cumulative effects of the campground rehabilitation projects could be mixed, combining both adverse and beneficial effects. For example, the rehabilitation of Tamarack Campground would have a short-term, adverse effect on park operations and facilities during planning and construction. Post-construction, maintenance would be reduced compared to existing conditions, resulting in a long-term, beneficial impact on park operations and facilities.

Reasonably foreseeable projects that could have an adverse effect on park operations and facilities include:

- The *Yosemite Valley Plan* (NPS), which would implement the goals of the 1980 *General Management Plan*
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several regional lodging projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Tioga Inn, Lee Vining (Mono Co.); Hazel Green Ranch (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.)
- Merced River Canyon Trail Acquisition (BLM)
- Sierra Nevada Framework for Conservation and Collaboration (USFS)

Each of these projects would increase demand for services and facilities and add to the cumulative, adverse impact on park operations and facilities. For example, the *Yosemite Valley Plan* could substantially increase demand on park operations and facilities in the short-term during planning, repair, rehabilitation, construction/demolition, and replacement of facilities (e.g., removal of the road through Stoneman Meadow, construction of new campsites, restoration of large areas of Yosemite Valley to natural conditions). However, it is acknowledged that several actions proposed under the *Yosemite Valley Plan* (e.g., consolidated parking facility at Yosemite Village) are not compatible with the management zones of Alternative 4. If Alternative 4 were selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 4. The effect on park operations and facilities would change, but the results of the change are speculative.

These past, present, and reasonably foreseeable future actions could have adverse, cumulative effects on park operations and facilities because of the increased demand on park operations services and facilities over both the short and long term. The combined effects of Alternative 4 with other cumulative projects would result in a long-term, moderate to major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Conclusions

Application of management zoning and the River Protection Overlay, in combination with development and implementation of the VERP framework, would substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by increased need for research, planning, and monitoring to establish scientifically based indicators, standards, and monitoring protocols for the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones and the River Protection Overlay to their desired conditions would further increase demand on park staff and resources. Overall, implementation of VERP in combination with other management elements proposed under Alternative 4, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Short-term, adverse impacts would be most pronounced in Yosemite Valley, El Portal, and Wawona. Over the long term, decreased visitation and use of Yosemite Valley and a total reduction in the

number of facilities would have a minor to moderate, beneficial effect on park operations and facilities. Visitation of Wawona, the gorge, and El Portal could increase if visitors were displaced from Yosemite Valley. The effects on park operations and facilities would be directly related to the change in visitation and could result in long-term, minor to major, adverse effects.

The combined effects of Alternative 4 with other cumulative projects would result in a long-term, moderate to major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Unavoidable Adverse Impacts

Under Alternative 4, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework.

The application of the River Protection Overlay could allow for the removal of human-made obstructions to the free-flowing condition of the river. If one or more of the historic bridges considered to be an obstruction to the free flow condition of the river were removed, then this would constitute an unavoidable adverse effect.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have an unavoidable adverse effect on park operations and facilities, because visitor use is relatively high (is expected to remain consistent or increase), access throughout the Valley is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. This effect would be most pronounced during initial application of VERP management actions, while park visitors became accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a unavoidable adverse effect on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Irreversible and Irretrievable Commitments of Resources

This section identifies any resources that would be lost either temporarily or permanently as a result of Alternative 4. This alternative provides a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework.

The application of the River Protection Overlay provides for the possibility of removing human-made obstructions, which include historic bridges, within the river corridor. If any bridges were removed, then the loss of this cultural resource would be permanent and irreversible.

If relocation of existing facilities within the river corridor occurred as a result of the management zone designations under Alternative 4, then this would result in the expenditure of energy to relocate or develop the facility. In addition, if the relocation of facilities occurred, then there would be an irreversible commitment of materials, such as concrete, asphalt, wood, and metal, that would be used in relocation or construction activities.

Relationship of Short-Term Uses of Man's Environment and Long-Term Productivity

This section compares the short- and long-term environmental effects of Alternative 4.

Under Alternative 4, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, the River Protection Overlay, and the Visitor Experience and Resource Protection (VERP) framework. The application of the River Protection Overlay that could have short-term adverse impacts and long-term beneficial impacts. Short-term impacts could occur if obstructions in the river were removed and streambanks along the river were restored. These actions could temporarily adversely affect biological resources along the river, including vegetation and wildlife, as well as water quality. In the long term, if streambank restoration and obstruction removal occurred, then this would enhance the free-flowing condition of the river and natural resource Outstandingly Remarkable Values (e.g., biological, hydrologic processes, etc.). The intensity of the impact would depend on the level of streambank restoration and the number of obstructions removed. Also in the long term, benefits could occur to floodplains if the river were restored to natural geomorphic conditions, to water quality if human interaction with the river were limited, and to biological resources if wetland habitat for plant and animal species were restored.

Alternative 5: Visitor Experience Emphasis, Wide Corridor

Alternative 5 provides for diverse visitor experiences and access to Yosemite National Park and the Merced River corridor. This alternative facilitates the full implementation of many of the goals and recommended actions of the *General Management Plan*, including the relocation of administrative and operations facilities out of Yosemite Valley to the El Portal Administrative Site.

For the duration of the *Merced River Plan*, Alternative 5 would provide a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of six management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, and the Visitor Experience and Resource Protection (VERP) framework. Compared to Alternative 1, which has no such management framework, this is considered to be a minor, beneficial impact for visitor experience, natural resources, cultural resources, social resources, and associated Outstandingly Remarkable Values.

Boundaries. Alternative 5 uses a quarter-mile boundary throughout the length of the river (see figures II-23 through II-26 in Chapter II, Alternatives). Changes to the boundaries proposed under this alternative would expand the area for which management zoning is applied compared to Alternative 1. Changes to the boundaries in and of themselves would have no effect on visitor experience, natural, cultural, and social resources, and Outstandingly Remarkable Values. Rather, it is the application of management zoning that has the potential to affect visitor experience, natural, cultural, and social resources, and Outstandingly Remarkable Values. The change to the boundaries is not discussed further in this alternative.

Classifications. Changes to the classifications (shown in figure II-3) proposed under this alternative would have no effect on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values. Changes to classifications proposed under Alternative 2 (east Yosemite Valley and Wawona are reclassified from scenic to recreational) are technical corrections made when the boundary was extended to the full quarter-mile and reflect existing access to the Merced River, shoreline development, and watershed development within these segments. Change in the classifications would not alter management or protection of the east Yosemite Valley or Wawona river segments. The change to the classifications is not discussed further in this alternative.

Outstandingly Remarkable Values. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised in this alternative based on the application of new scientific information, changed conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act (refer to Appendix E for a history of the Outstandingly Remarkable Values). Specifically, those resources that are not

directly related to the Merced River (e.g., western juniper, air quality, skiing, rock climbing) or are not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., 1916 Organic Act, Federal Endangered Species Act, Clean Water Act). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*. The change in Outstandingly Remarkable Values is discussed as appropriate under specific resource topics addressed for this alternative.

Section 7 Determination Process. The application of the consistent Section 7 determination process for water resources projects would provide a negligible, beneficial impact on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values compared to Alternative 1 because management direction for future water resources would be provided. Application of the consistent Section 7 determination process is discussed as appropriate under specific resource topics addressed for this alternative.

Management Zoning. Management zoning could have long-term, beneficial and adverse effects on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values within the Merced River corridor. This management element would limit the type of new facilities that could be built, would encourage the removal of inconsistent facilities, and would allow new development or redevelopment as appropriate. Management zoning is discussed as appropriate under specific resource topics addressed for this alternative.

Visitor Experience and Resource Protection. Implementation of the VERP framework would have beneficial and adverse impacts on visitor experience, natural, cultural, and social resources, and associated Outstandingly Remarkable Values. The VERP framework protects both park resources and visitor experience, with particular focus on the Outstandingly Remarkable Values, from impacts associated with visitor use, and helps managers address issues associated with visitor use. The VERP framework is discussed as appropriate under specific resource topics addressed for this alternative.

Natural Resources

Geology, Geohazards, and Soils

Analysis

General Impacts. Geologic resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., cirques, paternoster lakes) or not unique to the region or nation have been removed. Removal of these resources from the list of

Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*), as well as by federal law (the Organic Act, Wilderness Act). Geologic-process Outstandingly Remarkable Values include the mature, meandering nature of the Merced River through Yosemite Valley, a classic V-shaped river through the gorge, evidence of ice-age glaciation (U-shaped and hanging valleys), and extraordinary granite features (i.e., exfoliation domes). The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Rockfall Hazards. In developed areas under Alternative 5, management zoning allows additional buildings and facilities intended for visitor use and accommodation to be located within the floodplain as well as in rockfall-susceptible areas closer to the Valley or canyon walls. Most rockfalls are associated with triggering events such as earthquakes, climatic changes such as rainfall events, or gradual stress release and exfoliation of the granite. Relocation of facilities into rockfall-susceptible areas would be expected to occur primarily in Diverse Visitor Experience zones (2A-2D) and Developed zones (zone 3) such as Yosemite Valley, the Merced River gorge, and possibly along the South Fork in the Wawona area. The transit center/parking facility at Taft Toe (zone 3C), if constructed, would be placed in proximity to the rockfall shadow zone and could expose the structure and visitors to rockfalls and rock avalanches. Rockfall hazards will continue in the upper wilderness reaches of the Merced and South Fork, zoned as Wilderness (1A-1D), but their potential for impacts to visitors and facilities would be low and would not change from Alternative 1. Considering the unpredictable and unavoidable nature of rockfalls and the potential for them to occur throughout Yosemite National Park, Alternative 4 would result in a long-term, moderate, adverse impact on public safety from hazards associated with rockfall events.

Seismic Hazards. Historically, seismic events in the Sierra Nevada and Yosemite National Park have been relatively infrequent; however, when they do occur, the resultant groundshaking is capable of triggering rockfalls and producing ground accelerations that are higher than some older, less structurally stable buildings can tolerate. Typically, the seismic risks of injury to visitors and damage facilities would occur in the developed portions of Yosemite National Park such as Yosemite Valley, El Portal, and Wawona. In these areas, buildings and other facilities placed within saturated alluvial soil (for instance, within the floodplain of the Merced River) could also be susceptible to secondary hazards from seismic groundshaking, including liquefaction and seismically induced settlement. For example, within Yosemite Valley, any potential facility development at Camp 6 (zone 3C) would require construction within alluvial sediments that could be susceptible to effects of unstable soils (such as settlement) and, in the event of significant groundshaking, the effects of liquefaction. In undeveloped areas where visitor use is relatively low (for instance, in the upper wilderness reaches of the Merced River and the South Fork), groundshaking effects from seismic events would result in a lower potential for injury and structural damage.

Under Alternative 4, the National Park Service could retain and revise current management guidelines pertaining to geologic hazards and resources, such as those policies implemented to protect visitors and reduce damage to park infrastructure. If relocation of existing facilities out of

the floodplain were to occur, the National Park Service could conduct appropriate studies to determine proximity of the facility to the high-risk rockfall zones and the stability of the adjacent rock cliffs.

Under Alternative 5, as in Alternative 1, earthquakes in the Sierra Nevada region would continue to expose visitors in developed areas to potential injury in unstable buildings and to hazards from seismically triggered mass movement of rock slopes. Considering the potential for earthquake events in the Sierra Nevada, their unpredictable nature and unavoidable effects, Alternative 5 would have no impact on public safety related to seismic hazards compared to Alternative 1.

Impacts to Soils. Possible projects to accommodate increased visitor use in development zones could result in increased soil compaction, soil loss, and erosion. Compaction of native soils can occur through construction activity, concentrated visitor use in localized areas, or excessive vehicular traffic in unpaved areas. Construction excavation and replacement of native soils with engineered fills contribute to the reduction of local native soil. Excessive surface water runoff or loss of protective vegetation cover can cause erosion. Under management zoning for Alternative 5, it is possible that specific segments of the Merced River corridor would be subjected to concentrated visitor use that could result in increased adverse effects from erosion, compaction, and loss of surface soils. This could occur, for instance, in the Yosemite Valley, El Portal, and Wawona areas zoned as Developed zones (3A-3C) that provide for camping (zone 3A), lodging (zone 3B), or park operations (zone 3C). The effects of concentrated visitor use would be less intense in the upper wilderness reaches of the Merced River.

The possible future construction of facilities to accommodate increased visitor use, such as lodging or a new transit center, could result in increased soil compaction, soil removal, and erosion. As a result of efforts to manage visitor use to protect natural and cultural resources within the Merced River corridor, including management zoning and the VERP framework, soil erosion impacts due to visitor use and development projects would be less severe than under Alternative 1. The implementation of the VERP framework would have a long-term, moderate, beneficial impact on soil resources. For instance, if soil compaction were selected as an indicator of desired conditions under the VERP framework, violations of the standard associated with this indicator would result in management action to manage or limit visitor use in a particular area. The management action could be to install signs or fences directing visitor use toward resilient areas and away from sensitive resources.

Under Alternative 5, the potential for increased facility development and concentrated visitor use could result in further compaction, soil removal, and erosion. Considering management efforts to protect natural and cultural resources through the VERP framework and other site-specific geotechnical studies performed prior to the design and construction of any proposed facility, proposed development under Alternative 5 would result in a long-term, minor, adverse impact on soil resources.

Summary of Alternative 5 Impacts. Compared to Alternative 1, rockfall hazards under Alternative 5 would result in a long-term, moderate, adverse impact, especially considering that under Alternative 2, facilities could be relocated to areas susceptible to seismic hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable;

therefore, when compared to Alternative 1, Alternative 5 would have no impact on public safety associated with seismic hazards. The addition of new facilities and concentrated visitor use under Alternative 5 would result in a long-term, moderate, adverse impact on soil resources. Conversely, efforts to protect natural and cultural resources through implementation of the VERP framework would have a long-term, moderate, beneficial impact on soil resources, especially in zones supporting additional development. The combined effects of these adverse and beneficial impacts would result in a long-term, minor, adverse impact on soil resources.

Considering the collective risks associated with rockfalls, seismic hazards, and impacts to soil resources, the implementation of potential future actions in accordance with the management zones of Alternative 5 would result in a long-term, moderate, adverse impact.

Cumulative Impacts

Cumulative impacts to geological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect geological resources within the river corridor or in the park vicinity.

Various reasonably foreseeable future actions could eventually result in construction of additional structures and facilities within zones susceptible to adverse impacts from earthquakes and rockfalls. These facilities would likely be located in developed areas, including Yosemite Valley, the El Portal Administrative Site, and Wawona.

Past Actions. Development projects intended to serve park visitors in Yosemite National Park have included hotels, visitor centers, campgrounds, and bridges with associated roads and parking lots. In addition, facilities required for park infrastructure support, including employee housing, utility facilities, maintenance yards, and supply storage areas, have been developed throughout the park. As popularity of Yosemite attracted a greater number of visitors, the number and magnitude of these projects increased to meet visitor demand. Past actions have resulted in adverse impacts because projects were developed in areas that could be susceptible to damage from geohazards (rockfalls and seismic events), and facility development has contributed to the overall degradation of soil resources in the park.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects geology, geohazards, and soils. The reconstruction requires steepening the sheer rock slopes along the north side of the roadway, which increases the potential for rockfalls over the

short term (by decreasing stability of the rock slopes). However, under the direction of engineers, design features for rock cuts along the El Portal Road (e.g., rock-bolting using 30-foot-long dowells) serve to increase the long-term stability of the rock slopes. These design features are also used to stabilize colluvial soil cuts, thereby reducing erosion. On the south side of the El Portal Road, shoulder widening requires construction of a fill slope that, in certain areas, encroaches into the Merced River. These effects are partially mitigated by implementation of standard design and construction-related best management practices. The project also involves rehabilitation of the sewerline, which reduces potential soil contamination, and the improvement of roadway drainage, thereby reducing erosion. The encroachment of the fill slope into the Merced River would cause minor obstruction to the free-flowing condition of the river. Overall, the El Portal Road Reconstruction (Segment D) Project would have a beneficial impact by reducing rockfall and soil erosion potential.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on geohazards and soil resources include:

- Several campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS), both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- Transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., potential short-term construction erosion and soil loss), an objective of each of these projects is to restore and manage natural resources and reduce soil degradation. Therefore, these projects could have a net long-term, beneficial, cumulative impact on soil resources.

Reasonably foreseeable projects that could have both adverse and beneficial effects on regional geology, geohazards, and soils include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and White Wolf Water System Improvements (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Wawona Campground Improvement (NPS)
- Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

Cumulative effects of the above-referenced projects could be a combination of adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* is expected to have a long-term benefit on soil resources by increasing coordinated management of natural resources. However, short-term adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project above Cascades Diversion Dam). The current approach for the Segment D widening would require redesign. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., steepening of sheer rock slopes, potentially leading to short-term, slope instability, and traffic circulation, safety, and noise impacts). The net effect of these projects is difficult to anticipate, but would likely result in an overall balance between beneficial and adverse effects. Reasonably foreseeable projects that could have an adverse effect on regional geology, increase the potential for impacts related to geologic hazards, and increase soil degradation include:

- Merced River Canyon Trail Acquisition (BLM)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.)

- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak).

Certain development projects, as listed above, could expose additional visitors to risk of rockfall and seismic hazards and result in increased degradation of soil resources. Examples of projects that would result in a cumulative increase in park development include the construction of South Entrance/Mariposa Grove Site Planning (NPS), the new Resources Management Building (NPS), Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI); Hazel Green Ranch (Mariposa Co.), and the El Portal Road Reconstruction Project (NPS).

Considering that hazards from geological processes such as rockfalls and earthquakes are unavoidable and unpredictable, park visitors would continue to be exposed to injury and damage from these hazards, thus resulting in a cumulative, long-term, adverse impact. The cumulative effect of future development actions would increase the overall depletion of soil resources by increasing soil removal, compaction, and erosion. Restoration projects may offset the rate of overall soil resource depletion, but not to the extent of providing a cumulative benefit. Future development projects would result in a cumulative, long-term, minor to moderate, adverse impact to soil resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

Rockfall hazards under Alternative 5 and the cumulative projects would result in a long-term, moderate, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, Alternative 5 could relocate or construct facilities away from the floodplain and into areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury; therefore, Alternative 5 and the cumulative projects would have no impact to public safety associated with seismic hazards. Adverse impacts to soil resources under the cumulative projects could be reduced by Alternative 5 management zoning, and VERP and thus, result in a long-term, minor, adverse impact. Overall, Alternative 5 and the cumulative projects would have a long-term, minor to moderate, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor to moderate, adverse impact on soil resources.

Conclusions

Compared to Alternative 1, rockfall hazards under Alternative 5 would result in a long-term, moderate, adverse impact, especially considering that under Alternative 5, facilities could be relocated to areas susceptible to hazards or rockfalls. Earthquakes and associated hazards are unavoidable and their effects unpredictable; therefore, when compared to Alternative 1, Alternative 5 would have no impact on public safety associated with seismic hazards. The addition of new facilities and concentrated visitor use under Alternative 5 would result in a long-term, moderate, adverse impact on soil resources. Conversely, efforts to protect natural and cultural resources through implementation of the VERP framework would have a long-term,

moderate, beneficial impact on soil resources, especially in zones supporting additional development. The combined effects of adverse and beneficial impacts would result in a long-term, minor, adverse impact on soil resources.

Rockfall hazards under Alternative 5 and the cumulative projects would result in a long-term, moderate, adverse impact to public safety throughout Yosemite National Park because, although some localized projects may reduce these risks, Alternative 5 could relocate or construct facilities away from the floodplain and into areas susceptible to rockfalls. Earthquakes are unavoidable and unpredictable, and park visitors would continue to be exposed to potential injury; therefore, Alternative 5 and the cumulative projects would have no impact to public safety associated with seismic hazards. Adverse impacts to soil resources under the cumulative projects could be reduced by Alternative 5 management zoning and VERP and thus, result in a long-term, minor, adverse impact. Overall, Alternative 5 and the cumulative projects would have a long-term, minor to moderate, adverse impact on public safety from rockfalls and earthquakes and a long-term, minor to moderate, adverse impact on soil resources.

Considering the collective risks associated with rockfalls, seismic hazards, and impacts to soil resources, the implementation of potential future actions in accordance with the management zones of Alternative 5 would result in a long-term, moderate, adverse impact.

Hydrology, Floodplains, and Water Quality

Analysis

General Impacts. Hydrologic-process Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that do not accurately reflect site conditions (e.g., excellent water quality in Wawona and below Wawona) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Clean Water Act, 1916 Organic Act). Hydrologic-process Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now generally include excellent water quality, exceptionally steep gradients, extraordinary examples of cascades, and examples of unique hydrologic conditions. The revised Outstandingly Remarkable Values provide greater focus on the Merced River and values unique to the region or nation than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to hydrologic processes that could occur within each segment of the Merced River corridor from application of management elements proposed in Alternative 5.

Impacts in Wilderness. Examples of hydrologic-process Outstandingly Remarkable Values of wilderness segments of the main stem and South Fork of the Merced River include glacial remnants, a logjam in Little Yosemite Valley that is hundreds of years old, and numerous cascades, steep gradients, and excellent water quality. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning is not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative, these management elements would limit the type of new facilities that could be built (e.g., large campsites with facilities are prohibited in the 1B zone), which could adversely affect hydrology, floodplains, and water quality under the No Action Alternative. Although actions such as trail rehabilitation could occur under the proposed zoning, these actions would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values within wilderness segments of the Merced River (main stem and South Fork) by reducing visitor effects. For example, if VERP monitoring revealed elevated levels of fecal coliform bacteria in the Merced River due to visitor use (e.g., camping or hiking near the Merced River), VERP management actions (e.g., educational signs, limits on visitor use) could be implemented to achieve the desired condition for water quality in the management zone.

Impacts in Yosemite Valley. Hydrologic-process Outstandingly Remarkable Values within Yosemite Valley include the meandering river, world-renowned waterfalls, an active flood regime, oxbows, unique wetlands, and fluvial processes. Yosemite Valley would be zoned to protect natural resources while providing for a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B zone) that have the potential to adversely affect hydrology, floodplains, and water quality. In addition, possible future actions (e.g., bridge removal, bridge or road reconstruction, construction of new campsites) that could occur under the proposed zoning would be subject to the consistent set of criteria and considerations (including the Section 7 determination process), which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations would have a short- and long-term, negligible, beneficial effect on hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values.

Examples of how proposed management zoning, the VERP framework, and the criteria and considerations would protect and enhance hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- An example of the potential benefit to water quality would be the concentration of visitors and vehicles in the western portion of Yosemite Valley at Cathedral Beach (zoned 2C) and Sentinel Beach (zoned 2C). The designation of much of the river corridor in this area as Discovery (zone 2B) would focus visitor use to the 2C zones listed above. By limiting the currently dispersed use of the Merced River through this portion of Yosemite Valley to concentrated locations, nonpoint sources of pollution, such as refuse, bacteria, and petroleum and metal products associated with vehicles, would become more manageable.
- A majority of the floodplain in west Yosemite Valley would be zoned 2B and receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging) that have the potential to adversely affect floodplain characteristics (e.g., water recharge rates, flood dissipation), hydrologic processes of the Merced River (e.g., new facilities could constrict the channel of the Merced River), and water quality (e.g., short-term impacts during construction). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to be managed to their desired condition with continued protection, restoration, and enhancement of hydrologic processes resulting in a long-term, minor to moderate, beneficial impact.
- El Capitan Meadow is a river-related meadow within the 100-year floodplain of the Merced River. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has compacted meadow soils, altering the natural water recharge capabilities of the floodplain at this location. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient location outside the floodplain of the Merced River) at the base of El Capitan. This could increase opportunities for restoration of natural floodplain characteristics, resulting in a minor, site-specific, long-term, beneficial effect.

Examples of how management elements proposed under this alternative could have negative effects on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values in Yosemite Valley include the following:

- The allowable intensity of visitor use and possible increase in visitor facilities under Alternative 5 could substantially lessen any potential benefit from comprehensive floodplain management under the *Merced River Plan*. Under Alternative 5, adverse effects on the floodplain and river channel dynamics, as described under the No Action Alternative, could be negligibly reduced through implementation of the criteria and considerations. Alternative 5 provides for management and protection of the floodplain and outlines certain management directions under each zoning prescription in regard to river crossings and resource protection. However, the emphasis on visitor accommodation and day-visitor parking could reduce the potential benefit of these zoning prescriptions. Overall, floodplain protection and restoration would likely be indiscernible from management under the No Action Alternative. Therefore, the development and human activities that have negatively

influenced floodplain formation and evolution would still be present in the river corridor and would occur at levels in excess of current conditions. Therefore, Alternative 5 would constitute a major, long-term, adverse impact to floodplain conditions.

- A long-term, minor, adverse impact to water quality could occur as a result of the continued and likely increase of nonpoint-source pollution discharge to stormwater runoff from roads, parking lots, and other impervious surfaces introduced into the area to accommodate visitor use. If parking lots, roads, and other impervious surfaces were established where none currently exist, then vehicle-related pollutants and refuse would accumulate. This long-term, minor, adverse impact could be mitigated to a negligible level through the use of permeable surfaces and vegetated or natural filters or traps for filtering stormwater runoff. Other best management practices (Chapter II) for polluted runoff control include oil/sediment separators, street sweeping, and infiltration beds (soil capture of surface pollutants).
- Localized, short-term, minor, adverse impacts on water quality could occur from construction and demolition involving river impoundments, obstructions, or work within the river corridor. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade water quality. The application of construction/demolition best management practices (Chapter II) could lessen the potential for impacts to water quality. Implementation of a Storm Water Pollution Prevention Plan, as prescribed for all construction activities affecting over five acres (to be reduced to one acre in 2003) by the Environmental Protection Agency and the Regional Water Quality Control Board, would help to reduce potential short-term impacts on water quality due to construction activities. Storm Water Pollution Prevention Plans include best management practices for erosion control and containment of potential water quality pollutants. Such measures could reduce the potential adverse impacts to a negligible intensity.
- Relocation of facilities to other locations within the river corridor could have site-specific, long-term, negligible to major, adverse effects on hydrology, floodplains, and water quality, depending on site-specific conditions and project design. If actions resulted in relocation within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, long-term, adverse impacts to the floodplain of the Merced River could occur from construction of new facilities. For example, zones 3B and 3C at Camp 6, Housekeeping Camp, and a portion of Yosemite Lodge could allow new construction or reconstruction of facilities within the floodplain of the Merced River. New or reconstructed facilities could permanently alter the floodplain and floodplain characteristics (e.g., water recharge rates, floodwater dissipation) at these locations. Potential adverse effects associated with these zones could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to floodplains) in combination with the implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*.

Although site-specific, short- and long-term, negative effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 5 would provide increased protection for these river processes and associated Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of hydrologic process Outstandingly Remarkable Values of the gorge and El Portal include exceptionally steep gradients (2,000-foot elevation drop in approximately six miles) and continuous rapids. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 5 would affect hydrology, floodplains, and water quality and hydrologic process Outstandingly Remarkable Values of the Merced River Gorge and El Portal are described below.

- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area; therefore, visitor-induced impacts to water quality (e.g., human-induced erosion, the introduction of refuse and bacteria) could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to minor, adverse impacts on hydrology, floodplains, and water quality. Adverse effects could be mitigated to a negligible intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible, and visitor use and facilities are unlikely to increase. Consequently, there would be no impact on hydrology, floodplains, or water quality for the large portions of the gorge compared to the No Action Alternative.
- Large portions of El Portal within the floodplain of the Merced River would be zoned 3C (e.g., the Trailer Village, Old El Portal), which could allow additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., alteration of floodplain characteristics, alteration of hydrologic processes), minor to moderate, adverse effects on hydrology, floodplains, and water quality. Adverse impacts on water quality (e.g., sedimentation, oil, grease, fuels) would be related to construction (short-term) and use (long-term) of facilities. Adverse effects to the floodplain would be long term (i.e., building new facilities within the floodplain of the Merced River could alter water recharge rates or floodwater dissipation, or increase flood hazard on structures or individuals). Potential adverse impacts on hydrology and hydrologic processes could result from streambank stabilization (e.g., riprap) or channel modifications (e.g., rerouting the flow of the Merced River). These adverse effects to hydrology, floodplains, and water quality would be reduced to no impact or to a negligible to minor intensity by application of the criteria and considerations (including the Section 7 determination process), mitigation measures described in Chapter II (e.g., siting to avoid effects to floodplains, best management practices, oil and sediment separators), implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*, and implementation of VERP management actions.

Repair or redevelopment of existing facilities (e.g., El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts of the proposed design on hydrology, floodplains, and water quality and hydrologic-process Outstandingly Remarkable Values could include direct and permanent alteration of the floodplain, installation of fill or riprap within the Merced River, erosion and the long-term discharge of pollutants associated with use of the road (e.g., oil, grease, litter). These types of impacts would be long term, moderate to major, and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the

Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, Clean Water Act). Through these processes, project designs that avoid and minimize adverse effects to the Outstandingly Remarkable Values (including hydrologic processes) and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress, in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease, because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible intensity.

The application of management elements under this alternative would increase protection and enhancement of hydrology, floodplains, and water quality and associated Outstandingly Remarkable Values of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities within the floodplain of the Merced River that could have short- and long-term negative effects on hydrology, floodplains, and water quality. These impacts could be reduced to a negligible to minor intensity through the application of mitigation measures described in Chapter II, the criteria and considerations (including the Section 7 determination), and implementation of Executive Order 11988 on floodplain management and the *Floodplain Management Guidelines*.

Impacts in Wawona. Excellent water quality is listed as a hydrologic-process Outstandingly Remarkable Value of the impoundment above Wawona. No specific hydrologic-process Outstandingly Remarkable Values are listed for Wawona. Although the South Fork through Wawona would have a variety of zones, ranging from 1A (designated Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking that have the potential to adversely affect hydrology, floodplains, and water quality. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. In general, these facilities are located above the floodplain of the South Fork. The proposed zoning and continued use of these sites are not expected to adversely affect hydrologic processes compared to the No Action Alternative.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative.

Summary of Alternative 5 Impacts. For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long term, the combination of management zoning, the application of a consistent set of decision making criteria and

considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on flood hazards and hydrologic and geomorphic processes and related Outstandingly Remarkable Values within the river corridor, because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Alternative 5 could allow the continued existence of river obstructions that hinder free-flow conditions, which would continue the major, long-term, and adverse impact to free-flow conditions and natural hydrologic and geomorphic processes that are present under Alternative 1. Floodplain protection and restoration would likely be indiscernible from management under the No Action Alternative. A minor, long-term benefit to water quality could be achieved under Alternative 5 through the concentration of visitor-use areas and facilities, thereby reducing the number of locations where streambank erosion could occur. However, this benefit could be reduced by the potential increase (a moderate impact that is mitigable to a minor level) in nonpoint-source pollution generated from parking lots and roadways introduced to accommodate visitors. Site-specific, short- and long-term, negative effects to hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could alter floodplain characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning), in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), would allow the hydrologic and geomorphic processes to remain relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, negligible, and beneficial impact on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to hydrology discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect the watershed of the Merced River.

Past Actions. The Merced River has been historically affected by a variety of projects that have introduced obstructions into the river channel, modified the floodplain, and adversely affected water quality. Alterations to hydrology have occurred through development and use within the Merced River corridor since Euro-American settlement. Examples of projects that have had adverse effects on the hydrologic processes of the Merced River include bridges, riprap, removal of large woody debris, dikes, flood walls, impoundments, dams, and buildings.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general

management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects the water quality of the Merced River immediately adjacent to the roadway. The free-flowing condition of the Merced River has been adversely altered by direct placement of fill and riprap to widen and stabilize the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and by excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall short-term effects on water quality.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; (3) projects anticipated to have a net adverse effect; and (4) projects that would not affect the hydrological processes of the Merced River.

Examples of projects that could have a cumulative, beneficial effect on hydrological processes in the Merced River include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- South Fork Merced River Bridges Replacement (NPS)

Although each of the aforementioned projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects on water quality), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, the net cumulative effect of these projects would be a long-term, beneficial impact on hydrological processes of the Merced River.

A reasonably foreseeable project that could have mixed adverse and beneficial effects on hydrological processes includes:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. For example, implementation of the *Yosemite Valley Plan* has the potential to positively affect free flow of the Merced River by the proposed removal of the Cascades Diversion Dam. The *Yosemite Valley Plan* also has the potential to adversely affect water quality during construction activities related to Segment D of the El Portal Road Reconstruction Project (short-term), with the long-term, beneficial effect of improving water quality. Segment D reconstruction could cause similar types of impacts to those occurring during reconstruction of Segments A, B, and C of El Portal Road (e.g., effects to water quality). Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on hydrological processes include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Yosemite Motels, El Portal (Mariposa Co.)

Cumulative effects of these potential future projects on the Merced River watershed would be related to increased use and facility development, which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River.

Beneficial cumulative impacts on the Merced River watershed would be related to removal of facilities from the floodplain, removal of channel obstructions, and reduced human-related effects. Cumulative adverse effects to the Merced River watershed would be related to increased use and facility development which could result in streambank erosion, soil compaction, loss of vegetation, refuse accumulation, nonpoint-source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the cumulative actions listed above would have a long-term, minor, beneficial effect on hydrologic processes of the Merced River. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long term, negligible, and beneficial.

Conclusions

For the duration of this plan, management zoning would preclude various types of new development that have potential to adversely affect hydrology, floodplains, and water quality (a minor, beneficial impact). In the long term, the combination of management zoning, the application of a consistent set of decision-making criteria and considerations (including the

Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on flood hazards, hydrologic and geomorphic processes, and related Outstandingly Remarkable Values within the river corridor because these management elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor and floodplain, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, limit human interaction with the river, and manage zones to their desired conditions. Alternative 5 could allow the continued existence of river obstructions that hinder free-flow conditions, which would continue the major, long-term, and adverse impact to free-flow conditions and natural hydrologic and geomorphic processes that are present under Alternative 1. Floodplain protection and restoration would likely be indiscernible from management under the No Action Alternative. A minor, long-term benefit to water quality could be achieved under Alternative 5 through the concentration of visitor-use areas and facilities, thereby reducing the number of locations where streambank erosion could occur. However, this benefit could be reduced by the potential increase (a moderate impact that is mitigable to a minor level) in nonpoint-source pollution generated from parking lots and roadways introduced to accommodate visitors. Site-specific, short- and long-term, negative effects on hydrology, floodplains, and water quality could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new parking facilities could alter floodplain characteristics, use of new facilities could increase nonpoint-source pollution discharge to stormwater runoff). These effects would be most pronounced within the Developed zones in east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow the hydrologic and geomorphic processes to remain relatively unimpaired and would direct restoration and enhancement of impaired functions. This would result in a long-term, negligible, and beneficial impact on hydrologic processes and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

In total, the net effect of past, present, and reasonably foreseeable actions could have a long-term, minor, beneficial effect on hydrological processes in the Merced River watershed, because the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, cumulative beneficial effects associated with this alternative, in conjunction with other past, present, and reasonably foreseeable actions, could be long-term, negligible, and beneficial.

Wetlands

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak

woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wetland resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 5.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wetland-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning is not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wetland and aquatic habitats). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are wetland-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect these Outstandingly Remarkable Values while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further

developed, the proposed zoning of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Upper River and Lower River Campgrounds) that have the potential to adversely affect native wetland and aquatic habitats. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the VERP framework, and the criteria and considerations would protect and enhance native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive wetland habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of these wetland habitats resulting in a site-specific, long-term, minor, beneficial impact.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient upland location) at the base of El Capitan. This could increase opportunities for revegetation and restoration of natural wetland and aquatic habitats, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.
- The 2B zoning over a majority of the west Valley would preclude new launch/removal facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are more resilient to visitor use. Limiting this activity to particular points along the river, as opposed to current management practices, which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects could occur at locations such as Sentinel Beach and Cathedral Beach, containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on riparian vegetation, a biological resource-related Outstandingly Remarkable Value. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management

actions could reduce the severity of the identified site-specific adverse effects to a negligible or minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- The allowable intensity of visitor use and possible increase in visitor facilities under Alternative 5 could substantially lessen any potential benefit from comprehensive wetland management under the *Merced River Plan*. Under Alternative 5, adverse effects on floodplain wetlands, as described under the No Action Alternative, could be negligibly reduced through implementation of the criteria and considerations. Alternative 5 provides for management and protection of wetland and outlines certain management directions under each zoning prescription in regard to resource protection. However, the emphasis on visitor accommodation and day-visitor parking could reduce the potential benefit of these zoning prescriptions.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on wetlands, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on wetland, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor, short-term, adverse, temporary effects on native wetland and aquatic habitats could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native wetland and aquatic habitats. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to native wetland and aquatic habitats to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 5 would provide increased protection for native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wetland-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 5 would affect native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter, trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on native wetland and aquatic habitats. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to change. Consequently, there would be no impact on wetland and aquatic habitats or wetland-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with natural regeneration of riparian vegetation at the site. The current use of the sand pit would be inconsistent with the proposed 2C zoning and could be removed. This would allow for natural processes to prevail at this location and enhance natural revegetation with riparian species, resulting in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., radiating impacts from development), minor to moderate, adverse effects on native wetland and aquatic habitats. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts, long-term, minor to moderate, negative effects to native wetland and aquatic habitats (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park

Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wetland-related Outstandingly Remarkable Values, other vegetation resources (e.g., upland scrub or woodlands) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wetland-related Outstandingly Remarkable Values of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by visitors, and a nearly full range of riverine environments typical to the Sierra Nevada. The wilderness segments of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning is not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native wetland and aquatic habitats) under the No Action Alternative. Although possible future actions, such as trail rehabilitation, could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wetland and aquatic habitats and wetland-

related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Although the South Fork through Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day visitor parking. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. The proposed zoning and continued use of these sites is not expected to adversely affect site-specific wetland and aquatic habitats resources compared to the No Action Alternative. The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative.

Summary of Alternative 5 Impacts. For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect native wetland and aquatic habitats (a minor, beneficial impact). In the long-term, the combination of management zoning, the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wetland and aquatic habitats could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, minor, beneficial effects on wetland and aquatic habitats and wetland-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wetland and aquatic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wetland patterns (i.e., within the river corridor) as well as large-scale or regional wetland patterns.

Past Actions. Aquatic and riparian systems are the most altered and impaired habitats of the Sierra Nevada and are relatively rare in the context of the entire landscape. Wetlands in the Sierra Nevada have been drained since the earliest settlers attempted to “reclaim” meadows and other seasonally wet areas. Mountain meadows were commonly drained with the intent of improving forage conditions and to permit agriculture (Hughes 1934, as in NPS 1997b, University of California, Davis 1996). Development and activity in Yosemite National Park has reduced historic wet meadow acreage by 60-65%. Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, agriculture, buildings, campgrounds, and recreational features. Dams and diversions throughout most of the range have profoundly altered stream-flow patterns and water temperatures. Within the mountains, broad valleys with wide riparian areas were often reservoir sites, and much of the best former riparian habitat in the Sierra Nevada is now under water. The extent of the inundation across the range becomes apparent when one realizes that virtually all flatwater on the western slope of the Sierra Nevada below 5,000 feet is artificial (University of California, Davis 1996). These past actions have had long-term adverse effects on regional wetland and aquatic habitats.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wetlands of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wetlands include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, and Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- South Fork Merced River Bridges Replacement (NPS)

Although each of these projects may have site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wetlands. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wetland resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example is the update to the *Yosemite Wilderness Management Plan*, which could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wetlands include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For

example, implementation of the *Yosemite Valley Plan* is expected to have a long-term, beneficial impact to wetland resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature riparian vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on regional wetlands include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional growth. Each of the aforementioned projects has the potential to have site-specific, adverse effects on wetland and aquatic resources during construction (short-term) and by direct displacement of resources (long-term). Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to wetland and aquatic resources, the mitigation/compensation is

generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement.

Wetland and riparian systems of the Merced River and the Sierra Nevada have been substantially altered by development and visitor activities. These changes have negatively influenced wetland size, form, and function and the plants, wildlife, and aquatic species that inhabit them. Cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wetlands include wetland restoration, rehabilitation projects, and ecosystem management. Cumulative adverse effects would be related to past, present, and reasonably foreseeable increased facilities, regional growth, and visitor demand. Several of these cumulative actions could have a long-term, beneficial effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor. However, throughout the Sierra Nevada and larger region, regional development and growth could have a net long-term, adverse effect on regional wetland and aquatic resources that would not be compensated by local or regional planning and restoration projects. Therefore, cumulative adverse effects on regional wetland and aquatic habitats due to past, present, and reasonably foreseeable actions, could be major, adverse, and long term.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 5 could have a net long-term, major, adverse effect on regional wetland patterns.

Conclusions

For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect native wetland (a minor, beneficial impact). In the long-term, the combination of management zoning, the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on wetland and wetland-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wetland could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively

unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, minor, beneficial impact on native wetland and wetland-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on wetlands and wetland-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, major, adverse cumulative effect on regional wetland patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 5 could have a long-term, major, adverse effect on regional wetland patterns.

Vegetation

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the Federal Endangered Species Act, 1916 Organic Act, Clean Water Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special-status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to vegetation resources that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 5.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of vegetation-related Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and

use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning is not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation) under the No Action Alternative. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are vegetation-related Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning overall of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect native vegetation. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the VERP framework, and the criteria and considerations would protect and enhance native vegetation and vegetation related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact.

- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient upland location) at the base of El Capitan. This could increase opportunities for revegetation and restoration of natural vegetation, resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow.
- The 2B zoning over a majority of the west Valley would preclude new launch/removal facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are more resilient to visitor use. Limiting this activity to particular points along the river, as opposed to current management practices which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects could occur at locations such as Sentinel Beach and Cathedral Beach, containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on riparian vegetation, a biological resource-related Outstandingly Remarkable Value. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified site-specific adverse effects to a negligible or minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on native vegetation and vegetation related Outstandingly Remarkable Values in Yosemite Valley include the following:

- The Developed zones (zone 3A, 3B, and 3C) are designed to direct high-impact activities and facilities to areas better able to withstand heavy use and/or to those areas already developed. These zones could absorb the most concentrated visitor and administrative use with a higher tolerance for resource degradation. The woodlot and Pohono Quarry would be zoned 3C, consistent with current use. The proposed 3C zoning at either Taft Toe or Camp 6 and the 3B zoning at Yosemite Lodge could allow construction of new park facilities (e.g., parking, trail hardening). The 3A zoning at the existing North Pines, Lower Pines, and Upper Pines Campgrounds would allow construction of new campground facilities. New facilities could affect native vegetation such as black oak woodland and coniferous forest at these locations, increase human trampling of understory species in the immediate area, increase nonpoint-source pollution and refuse, decrease connectivity between habitats and the river, and increase the potential for introduction and spread of non-native species. It is anticipated that naturally occurring fires would be controlled around new structures, similar to existing park policy, and that this could affect species composition and forest health in the immediate vicinity of structures over the long term. Plant species richness and diversity generally decline where recreational activities occur, due to the physical effect of trampling itself and the tendency of plants with more resistance (tougher leaves, growth points below the ground surface, rapid growth rate, numerous seeds, etc.) to crowd out other species (Cole 1993). Overall, the structural form, connectivity, size, productivity, and diversity of native vegetation located at and in the vicinity of potential development sites could be adversely

affected (long-term, adverse, and moderate to major in intensity). The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified effects to a minor or negligible intensity.

- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., Clean Water Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on vegetation, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor, short-term, temporary effects on native vegetation could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement) could degrade the quality of native vegetation. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to native vegetation to a negligible intensity.

Although site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 5 would provide increased protection for native vegetation and vegetation-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of vegetation-related Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 5 would affect native vegetation and vegetation-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter, trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on native vegetation. Adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.

- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on vegetation or vegetation-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., fire suppression in the vicinity of structures), minor to moderate, adverse effects on native vegetation. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to native vegetation (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of vegetation and vegetation-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and

considerations (including the Section 7 determination) would protect vegetation-related Outstandingly Remarkable Values, other vegetation resources (e.g., upland scrub or woodlands) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of vegetation-related Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by humans, and a nearly full range of riverine environments typical to the Sierra Nevada. The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning is not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities, such as large campsites with facilities are prohibited in the 1B zone, that possibly could be built (potentially adversely affecting native vegetation), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native vegetation and vegetation-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general vegetation and vegetation-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Although the South Fork through Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day visitor parking. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona Maintenance Facility (zoned 3C) could continue to function consistent with existing conditions. The proposed zoning and continued use of these sites is not expected to adversely affect site-specific vegetation resources compared to the No Action Alternative. The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative.

Summary of Alternative 5 Impacts. For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long-term, the combination of management zoning, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a

moderate, beneficial, effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude some kinds of development, remove facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. Overall, application of management elements included in this alternative would have short- and long-term, minor, beneficial effects on vegetation and vegetation-related Outstandingly Remarkable Values compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to vegetation discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local vegetation patterns (i.e., within the river corridor) as well as large-scale or regional vegetation patterns.

Past Actions. In general, vegetation patterns of the Sierra Nevada are relatively intact compared to other areas of California. Regional vegetation has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Portions of the Merced River and South Fork corridors within Yosemite National Park are relatively natural, especially in wilderness areas where use has had little effect on vegetation. Development and use of infrastructure within Yosemite Valley and throughout the Sierra Nevada have caused long-term, adverse alterations to native vegetation patterns since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects vegetation of the Merced River

immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional vegetation include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, and Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native vegetation. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional vegetation include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)

- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect vegetation resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to vegetation resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) vegetation, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on regional vegetation include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)

- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on vegetation resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native vegetation patterns. Regional population growth primarily affects regional vegetation patterns through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development is required to mitigate or compensate for adverse effects to vegetation, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, major, adverse effect on regional vegetation resources that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 5 could have a net long-term, major, adverse effect on regional vegetation patterns.

Conclusions

For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect native vegetation (a minor, beneficial impact). In the long-term, the combination of management zoning, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on vegetation

and vegetation-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native vegetation could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, minor, beneficial impact on native vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, beneficial cumulative effect on vegetation and vegetation-related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have a long-term, adverse cumulative effect on regional vegetation patterns (e.g., introduction and spread of non-native species, direct displacement of vegetation by structures) that would not be compensated by piecemeal (i.e., project by project) mitigation. These cumulative actions in combination with Alternative 5 could have a long-term, major, adverse effect on regional vegetation patterns.

Wildlife

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan*, *Yosemite Resources Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special status species. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to wildlife resources that could occur within each segment of the Merced River corridor from application of management elements in Alternative 5.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of wildlife-related Outstandingly Remarkable Values of the upper Merced River include riverine wildlife habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special-status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning is not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wildlife). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of the upper Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Yosemite Valley. Riparian areas and low-elevation meadows are the most productive communities in Yosemite Valley. The high quality and large extent of riparian, wetland, and other riverine areas provide rich habitat for a diversity of river-related species, including special-status species, neotropical migrant songbirds, and numerous bat species. These are examples of wildlife-related Outstandingly Remarkable Values within Yosemite Valley.

Yosemite Valley would be zoned to protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning overall of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2C Day Use zone at Cathedral Beach) that have the potential to adversely affect native wildlife. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations

within would have a short- and long-term, minor, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the VERP framework, and the criteria and considerations would protect and enhance (i.e., beneficial effect) native wildlife and wildlife-related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for species likely to occur there, such as California newt and western aquatic garter snake, and would increase protection of potential California red-legged frog habitat (a wildlife-related Outstandingly Remarkable Value).
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially oriented recreational activities (No Action Alternative) to small-group and individually oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (an upland location lacking high value resources that is more resistant to adverse impacts) at the base of El Capitan. This could increase opportunities for revegetation and restoration of natural vegetation and wildlife habitat, resulting in a minor to moderate, site-specific, long-term, beneficial effect to the wildlife habitat of El Capitan Meadow.
- The 2B zoning over a majority of the west Valley would preclude new launch/take out facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are more resilient to visitor use. Limiting this activity to particular points along the river, as opposed to current management practices which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects to wildlife could occur at locations such as Sentinel Beach and Cathedral Beach (e.g., non-motorized watercraft could have a minor, adverse impact on fish habitat, mainly through riparian vegetation impacts but also due to pool-riffle structure), containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on the riparian wildlife habitat, a biological resource-related Outstandingly Remarkable Value. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified site-specific adverse effects to a negligible to minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on native wildlife and wildlife related Outstandingly Remarkable Values in Yosemite Valley include the following:

- The Developed zones (zone 3A, 3B, and 3C) are designed to direct high-impact activities and facilities to areas able to withstand heavy use and/or to those areas already developed. These zones could absorb the most concentrated visitor and administrative use with a higher tolerance for resource degradation. The woodlot and Pohono Quarry would be zoned 3C, consistent with current use. The proposed 3C zoning at either Taft Toe or Camp 6 and the 3B zoning at Yosemite Lodge could allow construction of new park facilities (e.g., parking, trail hardening). The 3A zoning at the existing North Pines, Lower Pines, and Upper Pines Campgrounds would allow construction of new campground facilities. New facilities could affect native wildlife habitats such as black oak woodland and coniferous forest at these locations, increase human trampling of understory species in the immediate area, increase nonpoint-source pollution and refuse, decrease connectivity between habitats and the river, and increase the potential for introduction and spread of non-native species. It is anticipated that naturally occurring fires would be controlled around new structures, similar to existing park policy, and that this could affect habitat composition in the immediate vicinity of structures over the long term. Species richness and diversity generally decline where recreational activities occur (Cole 1993). In addition, walk-in camps, greater distance between parking and campsites could result in a higher incidence of food in vehicles, leading to more food conditioning of bears and property damage. The higher use could over time indirectly affect wildlife diversity in the immediate area, due to a decrease in connectivity between habitats and the river, and could increase the potential for introduction and spread of non-native species such as the bullfrog, or parasitic species such as the cowbird. Disturbance-tolerant plants and animals would increase, at the expense of species sensitive to disturbance or with sensitive habitat elements (e.g., meadows and dependent wildlife species such as California voles and foraging raptors). Overall, the structural form, connectivity, size, productivity, and diversity of native wildlife and wildlife habitat located at and in the vicinity of potential development sites could be adversely affected (long-term, adverse, and moderate to major in intensity). The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified effects to a negligible to moderate intensity.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse affects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal regulations (e.g., the federal Endangered Species Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on native wildlife, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor to major, short-term, temporary effects on wildlife could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground

facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, noise, and introduction and spread of non-native species. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. The application of mitigation measures (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could lessen the potential for impacts to wildlife habitats (described in Chapter II). Implementation of such measures could reduce the potential adverse impacts to a negligible to moderate intensity.

Although site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 5 would provide increased protection for native wildlife and wildlife-related Outstandingly Remarkable Values compared to Alternative 1 resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of wildlife-related Outstandingly Remarkable Values of the Merced River gorge include diverse riparian areas that are largely undisturbed by humans and river-associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 5 would affect native wildlife and wildlife-related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- Localized, minor to major, short-term, temporary effects on wildlife could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, noise, and introduction and spread of non-native species. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. The application of mitigation measures (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could lessen the potential for impacts to wildlife habitats (described in Chapter II). Implementation of such measures could reduce the potential adverse impacts to a negligible to moderate intensity.
- New or expanded facilities (e.g., parking) could be built within the 2D zone below Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter (attractants for a number of wildlife including bears), trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on native wildlife. Adverse affects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on wildlife or wildlife-related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- The sand pit in El Portal was once used to mine sand from the Merced River and is currently used for construction staging and other administrative purposes. This use may interfere with riverine habitat and natural regeneration of riparian habitat at the site. The current use of the

sand pit would be inconsistent with the proposed 2C zoning and could be removed, which would allow for natural processes to prevail at this location, enhance the aquatic habitat (e.g., the removal of sources of pollutants would improve water quality and increase habitat values) and allow natural revegetation with riparian species. This could result in a site-specific, moderate, beneficial effect on this Outstandingly Remarkable Value.

- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, human presence, fire suppression in the vicinity of structures), minor to major, adverse effects on native wildlife. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, shielded lighting, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impacts to long-term, minor to moderate, negative effects to native wildlife (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long-term, the roadway (and the surrounding 2B and 2D management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of wildlife and wildlife-related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the

application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect wildlife-related Outstandingly Remarkable Values, other wildlife resources, such as upland wildlife species (e.g., bears, deer) could be adversely affected (long-term, moderate to major).

Impacts in Wilderness Segments of the South Fork. Examples of wildlife-related Outstandingly Remarkable Values of wilderness segments of the South Fork include a nearly full range of riverine environments typical to the Sierra Nevada that are largely intact and undisturbed by humans. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog.

The upper and lower portions of the South Fork (above and below Wawona) would be zoned 1A and 1B and reflect current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning is not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting native wildlife), providing a minor beneficial impact. Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, they would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on native wildlife and wildlife-related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on general wildlife and wildlife-related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian habitat based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone. However, there are existing limits to visitor use in wilderness that are based on resource protection goals.

Impacts in Wawona. Examples of wildlife-related Outstandingly Remarkable Values of Wawona includes diverse riparian areas that are intact and largely undisturbed by humans. River-related federal and state special-status species in this segment include Wawona riffle beetle.

Although the South Fork in Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking. This would result in a long-term, minor beneficial impact. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. The proposed

zoning and continued use of these sites is not expected to adversely affect site-specific wildlife resources compared to the No Action Alternative.

The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative. Site-specific, short-term negligible to minor adverse effects to wildlife could occur if facilities are constructed. These adverse impacts could be reduced to a negligible intensity by application of mitigation measures described in Chapter II. Overall, Alternative 5 would have a long-term negligible to minor beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values of the South Fork compared to the No Action Alternative.

Summary of Alternative 5 Impacts. For the duration of the plan, management zoning and the River Protection Overlay would preclude various types of new development that have the potential to adversely affect native wildlife (a minor, beneficial impact). In the long term, the combination of management zoning, the River Protection Overlay, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor. These elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to native wildlife could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning and the River Protection Overlay) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, moderate, beneficial impact on native wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to effect local wildlife patterns (i.e., within the river corridor) as well as large-scale or regional wildlife patterns.

Past Actions. Wildlife communities have been manipulated almost since the beginning of the park. Regional wildlife has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Fur-bearing mammals were trapped by park rangers until 1925; lions were considered dangerous predators and controlled through the 1920s; bears were artificially fed as a tourist

attraction until 1940. Natural wildfires, with their generally beneficial effects on wildlife habitat, were routinely suppressed until 1972 (Wuerthner 1994). Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

Yosemite's largest mammal, the grizzly bear, was extirpated from the region and from the state in the 1920s. Other mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by human activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including Yosemite National Park. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes.

Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Most fish currently found in the Merced River and its tributaries in Yosemite National Park have been introduced. Prior to trout stocking for sport fishing, native fish in Yosemite were probably limited to the rainbow trout and the Sacramento sucker, both of which were present only in the lower portions of the Merced River (i.e., Yosemite Valley and below). Rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or has displaced, the original strain.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects wildlife of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive

habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional wildlife include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional native wildlife. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional wildlife include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco),

- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect wildlife resources during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to wildlife resources by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) wildlife, loss of understory vegetation, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration.

Reasonably foreseeable projects that could have an adverse effect on regional wildlife include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development-related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road

Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)

- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native wildlife patterns. Regional population growth primarily affects regional wildlife patterns through construction (e.g., new housing and infrastructure) and human use. Examples of construction- and human-use-related effects on wildlife patterns include direct displacement of wildlife (e.g., replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment or backyard gardening), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). More importantly, some of the projects provide for increased residential growth adjacent to the park and would accommodate increased recreational development. In total, regional development and growth could have a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. For the species at higher elevations, the effects are somewhat mitigated by resource protection planning and restoration. Although each new development is required to mitigate or compensate for adverse effects to wildlife, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate, adverse effect on regional wildlife resources that would not be compensated by regional planning and restoration projects discussed above.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be moderate, adverse, and long term.

Conclusions

For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect native wildlife (a minor, beneficial impact). In the long-term, the combination of management zoning, application of a consistent set of decision making criteria and considerations (including the Section 7 determination process), and

implementation of the VERP framework would have a moderate, beneficial effect on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Large portions of East Yosemite Valley and El Portal would be zoned 3A, 3B, and 3C. The application of this zoning could allow construction of new park facilities (e.g., parking, trail hardening, employee housing, support facilities, offices). The 3A and 3B zoning through a large portion of eastern Yosemite Valley would allow reconstruction of facilities to levels in place before the 1997 flood and construction of new facilities (e.g., campsites at Upper River Campground). New facilities or reconstruction of facilities could have major, long-term, adverse effects on the abundance, diversity, and distribution of wildlife. Localized, minor, short-term, temporary, adverse effects on wildlife and wildlife habitat could occur from construction and demolition activities. Overall, application of Alternative 5 would have a long-term, negligible, beneficial impact on wildlife and wildlife-related Outstandingly Remarkable Values within the river corridor compared to the No-Action Alternative.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have negatively influenced wildlife and wildlife habitat. Past, present, and future cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Although general effects associated with this alternative are beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions would be moderate, adverse, and long term.

Rare, Threatened, and Endangered Species

Analysis

General Impacts. Biological resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., western juniper, white fir, black oak woodlands, Mount Lyell salamander) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, *Yosemite Vegetation Management Plan*), as well as by federal law (e.g., the federal Endangered Species Act, 1916 Organic Act). Biological resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include riverine habitats, such as riparian forests, meadows, and the aquatic environment and associated special status species. The revised Outstandingly Remarkable

Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

The following discussion provides an overview of the types of impacts to rare, threatened, and endangered species that could occur within each segment of the Merced River corridor from application of management elements included in Alternative 5.

Impacts in the Wilderness Segment of the Upper Main Stem Merced River. Examples of biological resource Outstandingly Remarkable Values of the upper Merced River include riverine habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special status plant species. The upper Merced River would be zoned consistent with existing conditions and use (1A, 1B, 1C, and 1D) and reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning is not anticipated to alter use patterns or existing facilities within the upper Merced River, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, or endangered species). Although possible future actions (e.g., trail rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, or endangered species and related Outstandingly Remarkable Values of the upper wilderness segment of the main stem Merced River by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of high elevation meadows, a habitat for rare, threatened, or endangered species, based on visitor use (e.g., camping), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the meadow and management zone.

Impacts in Yosemite Valley. Riverine habitats such as riparian forests, meadows, and the aquatic environment of the Merced River and associated special-status species are biological resource Outstandingly Remarkable Values within Yosemite Valley. Yosemite Valley would be zoned to protect natural resources while providing a diverse visitor experience. Although large portions of the east Valley would remain developed or could be further developed, the proposed zoning overall of Yosemite Valley is more restrictive than the absence of zoning in the No Action Alternative. The proposed zoning would preclude several types of new development (e.g., new campsites would be precluded in the 2B Discovery zone) that have the potential to adversely affect rare, threatened, or endangered species. In addition, possible future actions (e.g., bridge removal, construction of new campsites) that could occur under the proposed zoning, would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within would have a short- and

long-term, negligible, beneficial effect on rare, threatened, or endangered species and related Outstandingly Remarkable Values.

Examples of how proposed management zoning, the VERP framework, and the criteria and considerations would protect and enhance rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- Sensitive native habitats within Yosemite Valley (zoned 2A) would receive increased protection compared to the No Action Alternative. The zoning precludes a variety of new facilities (e.g., paved roads or trails, bicycle paths, day-visitor parking, food service, lodging). Under the VERP framework, this zone would be managed (over the long-term) with a very low tolerance for resource degradation from visitor use. Limits on the effects of visitor use (VERP framework) and facilities (management zoning) would allow existing natural areas to remain relatively unimpaired with continued protection, restoration, and enhancement of native habitats resulting in a site-specific, long-term, minor, beneficial impact for special status-species likely to use wet meadows for foraging, such as western mastiff bat.
- El Capitan Meadow is a river-related meadow and is considered part of the biological resource Outstandingly Remarkable Value. The 2B zoning would shift emphasis from unconfined and undirected, large-group and socially-oriented recreational activities (No Action Alternative) to small-group and individually-oriented activities. El Capitan Meadow is used as an informal viewing location of climbers of El Capitan. A high level of visitor use has degraded the meadow through trampling, soil compaction, and fragmentation. The current level of use of El Capitan Meadow would be inconsistent with the 2B zoning. Under the 2B zoning and the VERP framework, management actions—including restoration of El Capitan Meadow—could be implemented. Visitors could be directed to the proposed 2C picnic area (a more resilient upland location) at the base of El Capitan. This could increase opportunities for revegetation and restoration of natural vegetation and habitat resulting in a moderate to major, site-specific, long-term, beneficial effect to El Capitan Meadow and a variety special-status species which are also Outstandingly Remarkable Values, such as great gray owl, foothill yellow-legged frog, and numerous bat species.
- The 2B zoning over a majority of the west Valley would preclude new launch/removal facilities for non-motorized watercraft. These facilities would be allowed at specific locations, such as Sentinel Beach (zoned 2C) and Cathedral Beach (zoned 2C) that are better able to withstand heavy visitor use. Limiting this activity to particular points along the river, as opposed to current management practices which do not constrain launchings, would increase protection and allow increased restoration over the entire length of the river within Yosemite Valley. Although site-specific, minor to moderate, long-term, adverse effects could occur at locations such as Sentinel Beach and Cathedral Beach, containment of such effects in a limited area, while protecting a much larger area would result in a net long-term, moderate, beneficial effect on riparian species. Use of non-motorized watercraft could have a minor but more dispersed adverse impact on special-status wildlife (e.g., yellow warbler), mainly through riparian vegetation impacts but also due to noise. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified site-specific adverse effects to a negligible or minor intensity.

Examples of how management elements proposed under this alternative could have negative effects on rare, threatened, or endangered species and related Outstandingly Remarkable Values in Yosemite Valley include the following:

- The Developed zones (zone 3A, 3B, and 3C) are designed to direct high-impact activities and facilities to areas able to withstand heavy use and/or to those areas already developed. These zones could absorb the most concentrated visitor and administrative use with a higher tolerance for resource degradation. The woodlot and Pohono Quarry would be zoned 3C, consistent with current use. The proposed 3C zoning at either Taft Toe or Camp 6 and the 3B zoning at Yosemite Lodge could allow construction of new park facilities (e.g., parking, trail hardening). The 3A zoning at the existing North Pines, Lower Pines, and Upper Pines Campgrounds would allow construction of new campground facilities. New facilities could affect rare, threatened, or endangered species, if present, at these locations, increase human trampling of understory species in the immediate area, increase nonpoint-source pollution and refuse, decrease connectivity between habitats and the river, and increase the potential for introduction and spread of non-native species. It is anticipated that naturally occurring fires would be controlled around new structures, similar to existing park policy, and that this could affect species composition in the immediate vicinity of structures over the long term. Species richness and diversity generally decline where recreational activities occur (Cole 1993). Overall, the structural form, connectivity, size, productivity, and diversity of rare, threatened, and endangered species located at and in the vicinity of potential development sites could be adversely affected (long-term, adverse, and moderate to major in intensity). The higher use over time could indirectly affect wildlife diversity in the immediate area due to a decrease in connectivity between habitats and the river, and an increase in the potential for introduction and spread of non-native species such as the bullfrog, or parasitic species such as the cowbird. Disturbance-tolerant plants and animals would increase, at the expense of species sensitive to disturbance or with sensitive habitat elements (e.g., meadows and dependent wildlife species, such as California voles and foraging raptors). Rare, threatened, or endangered species directly or indirectly affected could include northern goshawk, yellow warbler, great gray owl, and special-status bats. The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions could reduce the severity of the identified effects to a minor or negligible intensity.
- Relocation of facilities to other locations within the park (outside the river corridor) could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated outside the river corridor, adverse effects could be reduced to a negligible to minor intensity by implementation of standard park policy and federal law (e.g., federal Endangered Species Act).
- Relocation of facilities to other locations within the corridor could have site-specific, long-term, negligible to major, adverse effects on rare, threatened, and endangered species, depending on site-specific conditions and project design. If relocated within the river corridor, adverse effects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions.
- Localized, minor, short-term, temporary effects on special-status species could occur from construction (e.g., potential transit center and/or day-visitor parking facility, new campground facilities) and demolition (e.g., removal of impoundments and bridges) along the Merced River. Effects would be related to heavy equipment and construction/demolition activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of construction-related pollutants (fuels, lubricants, cement)

could degrade the quality of native habitats. These actions could result in direct losses of nests or burrows, and indirect effects through the disturbance of nesting birds. Bridge removal could also adversely affect roosting bats (if present). The application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) could reduce the potential adverse impacts to special-status species to a negligible intensity.

Although site-specific, short- and long-term, negative effects to rare, threatened, or endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair), the overall design of Alternative 5 would provide increased protection for rare, threatened, or endangered species and related Outstandingly Remarkable Values compared to Alternative 1, resulting in a net long-term, moderate, beneficial effect.

Impacts in the Merced River Gorge and El Portal. Examples of Outstandingly Remarkable Values of the gorge and El Portal include diverse riparian areas and associated special-status species. The majority of the Merced River gorge would be zoned 2A+, 2B, 2C, and 2D. El Portal would have a base zone of 2C with large tracts zoned 3C. Examples of how the management elements of Alternative 5 would affect rare, threatened, and endangered species and related Outstandingly Remarkable Values of the Merced River gorge and El Portal are described below.

- New or expanded facilities (e.g., parking) could be built within the 2D zone below the Cascades. As an Attraction zone, visitors would be actively directed to this area, therefore, visitor induced impacts, such as soil compaction, litter, trampling, also could occur. New or expanded facilities and increased visitor use could have long-term, site-specific, negligible to moderate, adverse impacts on rare, threatened, and endangered species. Adverse affects could be mitigated to a negligible to minor intensity by implementation of mitigation measures described in Chapter II in combination with the implementation of VERP management actions.
- With the exception of the Cascades, the majority of the gorge is relatively inaccessible and visitor use is unlikely to increase. Consequently, there would be no impact on rare, threatened, and endangered species or related Outstandingly Remarkable Values for the large portions of the gorge compared to the No Action Alternative.
- Large portions of El Portal would be zoned 3C (e.g., the Trailer Village, old El Portal), which could allow additional development (e.g., employee residences located in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have both short-term (e.g., construction-related) and long-term (e.g., night lighting, noise, fire suppression in the vicinity of structures), minor to moderate, adverse effects rare, threatened, and endangered species. Although application of mitigation measures described in Chapter II (e.g., siting to avoid effects to sensitive habitats, habitat compensation, best management practices, oil and sediment separators, visitor education) in combination with the implementation of VERP management actions, would reduce impact, long-term, minor to moderate, negative effects to rare, threatened, and endangered species (e.g., conversion of upland woodland or scrub vegetation to developed facilities) would remain.

Repair or redevelopment of existing facilities (e.g., the El Portal Road) would not be precluded by the proposed zoning and could occur. For example, in the future the National Park Service could propose to reconstruct the El Portal Road. Impacts on native wildlife and wildlife-related Outstandingly Remarkable Values of the proposed design could include direct and permanent loss

of riparian habitats, blasting, nest removal, dust, noise, erosion and the long-term discharge of pollutants associated with use of roads (e.g., oil, grease, litter). These types of impacts would be long-term, moderate to major and adverse. The National Park Service would first subject the proposed action to the decision-making criteria and considerations. If the proposed action would affect the bed or banks of the Merced River (i.e., a water resources project), the National Park Service then would complete a Section 7 Wild and Scenic Rivers Act determination, as well as other appropriate documentation (e.g., National Environmental Policy Act, federal Endangered Species Act). Through these processes, project designs that avoid and minimize the adverse effects to the Outstandingly Remarkable Values (including streamside vegetation), wetlands, wildlife and resources in general would be identified. Projects that cannot be redesigned would either be abandoned or could proceed following notification, in writing, of the Secretary of the Interior and the United States Congress in accordance with Section 7(a) of the act. During reconstruction, mitigation measures described in Chapter II would be applied. Road maintenance and its associated temporary impacts would decrease because the road would be more stable and require less intensive and less frequent maintenance. Over the long term, the roadway (and the surrounding management zones) would be managed through the VERP framework to the desired conditions. In total, the application of management elements included in this alternative would reduce the negative effects of the original project design to a negligible to minor intensity.

The application of management elements under this alternative would increase protection and enhancement of rare, threatened, and endangered species and related Outstandingly Remarkable Values in the of the gorge. The proposed zoning in El Portal could allow additional development of park administration facilities that could have short- and long-term negative affects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new park administration facilities, road repair). These impacts could be reduced through the application of mitigation measures described in Chapter II. Although the criteria and considerations (including the Section 7 determination) would protect river-related rare, threatened, and endangered species (Outstandingly Remarkable Values), other rare, threatened, and endangered species (e.g., upland rare, threatened, and endangered species) would be mitigated for during consultation with the U.S. Fish and Wildlife Service pursuant to the Federal Endangered Species Act.

Impacts in Wilderness Segments of the South Fork. Examples of biological resource Outstandingly Remarkable Values within wilderness segments of the South Fork include high riparian species diversity, wetlands, riparian areas that are intact and largely undisturbed by humans, and a nearly full range of riverine environments typical to the Sierra Nevada. Examples of river-related federal and state special-status species include Wawona riffle beetle and mountain yellow-legged frog. The upper (above Wawona) and lower (below Wawona) portions of the South Fork would be zoned 1A and 1B and reflects current management practices and use levels based on the Wilderness Act along with federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning is not anticipated to alter use patterns or existing facilities within the wilderness portions of the South Fork. However, these management elements would limit the type of new facilities (e.g., large campsites with facilities are prohibited in the 1B zone) that possibly could be built (potentially adversely affecting rare, threatened, and endangered species), providing a minor beneficial impact. Although possible future actions (e.g., trail

rehabilitation) could occur under the proposed zoning, it would be subject to the consistent set of criteria and considerations (including the Section 7 determination process) which would guide how the action could be implemented. The application of zoning in combination with the consistent set of criteria and considerations within wilderness segments would have a short- and long-term, negligible, beneficial effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values.

Implementation of the VERP framework and VERP management actions could have long-term, negligible to minor, beneficial impacts on rare, threatened, and endangered species and related Outstandingly Remarkable Values of wilderness portions of the South Fork by reducing visitor effects on these sensitive resources. For example, if VERP monitoring reveals degradation of riparian zones based on visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for the riparian habitat and management zone.

Impacts in Wawona. Although the South Fork through Wawona would have a variety of zones, ranging from 1A (Wilderness) to 3C (Park Operations and Administration), the base zones would be 1A, 2A, and 2B. The 1A, 2A, and 2B zones would preclude new development such as interpretive centers, food services, campgrounds and lodging, and day-visitor parking. Wawona Golf Course and Wawona Picnic Area (zoned 2C), Wawona Campground (zoned 3A), Wawona Hotel (zoned 3B), and the Wawona maintenance facility (zoned 3C) could continue to function consistent with existing conditions. The proposed zoning and continued use of these sites is not expected to adversely affect site-specific rare, threatened, and endangered species compared to the No Action Alternative. The proposed zoning is not anticipated to substantially alter use patterns or facilities of the South Fork compared to the No Action Alternative.

Summary of Alternative 5 Impacts. For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial, effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, minor, beneficial impact on rare, threatened, and

endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Cumulative Impacts

Cumulative effects to rare, threatened, and endangered species discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region. The intensity of impact depends on whether the impacts are anticipated to interact cumulatively. For example, factors external to the park, such as broad regional habitat degradation and pesticide use, can combine with existing, in-park impacts, such as non-native species, to cause declines in rare, threatened, or endangered amphibians (e.g., mountain yellow-legged frog and Yosemite toad), an adverse, cumulative impact. The projects identified below include those projects that have the potential to effect populations of rare, threatened, or endangered species (i.e., within the river corridor) as well as large-scale or regional populations of the same species.

Past Actions. Natural habitats have been manipulated almost since the beginning of the park. Regional wildlife and rare, threatened, and endangered species patterns have been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of non-native species. Mammal species that survive but are extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by visitor activity, but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. Amphibians in Yosemite National Park have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, mountain yellow-legged frogs and Yosemite toads are still present in a number of areas, but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, non-native fish, pesticides, and diseases. Past and ongoing activities that affect rare, threatened, or endangered species include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway from the park boundary to the Cascades Diversion Dam, and affects habitats immediately adjacent to the roadway. Special-status species with potential to be affected during construction include Valley elderberry longhorn beetle, roosting bats, peregrine falcon, and Tompkin’s sedge. Special-status roosting bats could be affected, primarily through the noise generated by construction equipment and blasting. Blasting is also a concern for the peregrine falcon, known to occur at the Cascades aerie in the project vicinity (the peregrine was recently delisted but continues to be a species of concern in the park). Adverse effects to these species are avoided or minimized during construction by implementation of a compliance monitoring program, pre-construction surveys, erosion and sediment controls, minimizing noise during sensitive biological periods, construction timing restrictions, hazardous materials controls, rerare, threatened, and endangered species and reclamation, and excluding construction from sensitive habitats. Such measures ensure the overall protection and enhancement of the hydrologic, biological, geologic, cultural, scenic, scientific, and recreation Outstandingly Remarkable Values in the zone as a whole and other parts of the river corridor. Implementation of these measures reduces the overall effects.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional rare, threatened, or endangered species include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Hodgdon Meadow Campground; and Wawona Campground Improvement (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS), which has a goal of improving ecosystem health and meadow restoration
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); each of which will address ecosystem management issues of lands adjacent to Yosemite National Park
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]) which have the general goals of increasing transportation options and reducing reliance on automobiles in the area

Although each of these projects may have slight site-specific and short-term adverse effects (e.g., construction-related effects), the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects could have a long-term, beneficial cumulative impact to regional rare, threatened, or endangered species. For

example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and possibly stock use.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on regional rare, threatened, and endangered species include:

- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- The Tuolumne Meadows Water and Wastewater Improvements; the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); O'Shaughnessy Compound Water System Improvements (City and Co. San Francisco)
- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- The A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The *Yosemite Valley Plan* (NPS), which would implement the goals and actions of the 1980 *General Management Plan* (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS), which will restore giant sequoia habitat in the Lower Mariposa Grove of Giant Sequoias in Yosemite National Park

Cumulative effects of these projects could be mixed, combining both adverse and beneficial effects. The net beneficial or adverse effects of these projects are difficult to anticipate. For example, implementation of the Tuolumne Meadows Water and Wastewater Improvements project has the potential to adversely affect rare, threatened, and endangered species during construction (short-term), with the long-term, beneficial effect of improving water quality through improved wastewater treatment. Another example would be implementation of the *Yosemite Valley Plan*. Overall, implementation of this plan is expected to have a long-term, beneficial impact to rare, threatened, and endangered species by increasing coordinated management of natural resources and reducing facilities within sensitive habitats. However, short-term, adverse effects of this plan may include temporary construction impacts (e.g., potential reconstruction of Segment D of the El Portal Road Reconstruction Project just above Cascades Diversion Dam). Reconstruction of Segment D could cause short-term adverse impacts to natural resources similar to those currently occurring during reconstruction on Segments A, B, and C. These would include loss of mature (overstory) rare, threatened, and endangered species, loss of understory rare, threatened, and endangered species, impacts to special-status species, loss of topsoil, and footprint effects. Adverse impacts associated with Segment D reconstruction could be partially mitigated through project design (the design of Segment D would need to protect and enhance the Outstandingly Remarkable Values of the Merced River) and implementation of best management practices, compliance monitoring, and restoration. However, some of the proposed redevelopment in El Portal, for example, the redevelopment of the sand pit, would be inconsistent with the management zoning in this alternative of the *Merced River Plan/FEIS*. The *Merced River Plan* guides future allowable actions within the Merced River corridor and subsequent

implementation plans, such as the *Yosemite Valley Plan*. If Alternative 5 is selected, revisions to the *Yosemite Valley Plan* would be required to conform to the management zones provided in Alternative 5. Components of the *Yosemite Valley Plan* would need to change to conform to this alternative. The broad goals of the *Yosemite Valley Plan*, however, would continue to apply, including reclaiming priceless natural beauty, allowing natural processes to prevail, and reducing crowding. In general, revision to the *Yosemite Valley Plan* to comply with this alternative would have a general beneficial effect due to the underlying zoning prescribed in this alternative.

Reasonably foreseeable projects that could have an adverse effect on regional rare, threatened, and endangered species include:

- The Yosemite View parcel land exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Several development related projects, such as the Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Crane Flat Campus Redevelopment (NPS, YNI); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); Road Realignment and Bridge Replacement at Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); and San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Several water-related projects, such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, and O'Shaughnessy Dam Well (City and Co. San Francisco)

Cumulative adverse effects would be related to increased facilities, access, and regional population growth. Each of the aforementioned projects has the potential to have substantial site-specific adverse effects on rare, threatened, and endangered species during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including rare, threatened, and endangered species. Regional population growth primarily affects regional rare, threatened, and endangered species through construction (e.g., new housing and infrastructure) and visitor use. Examples of construction- and human-use-related effects on rare, threatened, and endangered species include direct displacement of rare, threatened, and endangered species (e.g., nest trees removed and replaced with structures), introduction of non-native species that invade into adjacent natural areas and displace native species (e.g., the spread of yellow star thistle by construction equipment and its subsequent adverse impacts on special status plant species), fragmentation of habitats that prevents genetic mixing, alteration of natural patterns (e.g., use of herbicides, the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). Although each new development

is required to mitigate or compensate for adverse effects to rare, threatened, and endangered species, the mitigation/compensation is generally uncoordinated and does not typically replace natural ecosystem functions or values that were present throughout the region prior to Euro-American settlement. In total, regional development and growth could have a net long-term, moderate to major (depending on species-specific impacts), adverse effect on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above.

Although cumulative actions could have a long-term, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects) and have long-term, moderate to major (depending on species-specific impacts), adverse cumulative impacts on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above. These cumulative actions in combination with Alternative 5 could have a net long-term, major, adverse effect on regional rare, threatened, and endangered species.

Conclusions

For the duration of this plan, management zoning would preclude various types of new development that has potential to adversely affect rare, threatened, and endangered species (a minor, beneficial impact). In the long term, the combination of management zoning, application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process), and implementation of the VERP framework would have a moderate, beneficial effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor because these elements could preclude inappropriate development, remove inappropriate facilities from the immediate river corridor, subject new actions to a rigorous planning process designed to eliminate adverse effects on the Outstandingly Remarkable Values, and manage zones to their desired conditions. Site-specific, short- and long-term, negative effects to rare, threatened, and endangered species could occur as the result of future actions that could be implemented under the proposed zoning (e.g., new campsites, parking facilities, road repair). These effects would be most pronounced within the Developed zones within east Yosemite Valley and El Portal. Overall, limits on the effects of visitor use (VERP framework) and facilities (management zoning) in combination with the application of a consistent set of decision-making criteria and considerations (including the Section 7 determination process) would allow existing natural areas to remain relatively unimpaired with continued protection and would direct restoration and enhancement of impaired native habitats. This would result in a long-term, minor, beneficial impact on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor compared to the No Action Alternative.

Although cumulative actions could have a long-term, major, beneficial cumulative effect on rare, threatened, and endangered species and related Outstandingly Remarkable Values within the river corridor, throughout the Sierra Nevada and larger region, these past, present, and reasonably foreseeable future actions are likely to increase regional growth (construction and human-use-related effects)

and have a long-term, major, adverse cumulative effect on regional rare, threatened, and endangered species (e.g., introduction and spread of non-native species, direct displacement of habitat by structures). These cumulative actions in combination with Alternative 5 could have a net long-term, major, adverse effect on regional rare, threatened, and endangered species.

Air Quality

Analysis

General Impacts. Under Alternative 5, air quality in the corridor would continue to be influenced by local sources within the park and by regional sources upwind of the park. The differences between air quality conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 5, “air quality” would be eliminated as an Outstandingly Remarkable Value along all river segments; construction or demolition activities could be more frequent and extensive; a centralized transit center and/or day-visitor parking facility could be developed; the number of day-visitor parking spaces could be reduced; the number of campsites could increase; and certain administrative functions and employee housing could be relocated from Yosemite Valley to the El Portal Administrative Site.

Under Alternative 5, air quality would be removed from the list of Outstandingly Remarkable Values along all segments of the main stem of the Merced River and the South Fork within the park. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Air quality has been removed as an Outstandingly Remarkable Value because it is not river-related nor is it unique within the region or nation context. However, the removal would not impact air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value. Emissions sources in the park would continue to be regulated pursuant to applicable provisions of the federal Clean Air Act, local air district *Rules and Regulations*, park campfire regulations, the *Fire Management Plan*, and state and federal motor-vehicle emissions control programs.

Under this alternative, some facilities could be constructed and other facilities removed based on the new management zoning designations. Construction or demolition activities could generate substantial amounts of dust (including particles with diameters of 10 microns or less [PM-10] and particles with diameters of 2.5 microns or less [PM-2.5]), primarily from “fugitive” sources (i.e., emissions released through means other than through a stack or tailpipe), and lesser amounts of other criteria air pollutants, primarily from operation of heavy equipment. Dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, construction activities could result in significant quantities of dust, and, as a result, local visibility and PM-10/PM-2.5 concentrations could be adversely affected. Without mitigation, dust raised by construction or demolition activities would have a major but temporary effect in the immediate vicinity of individual sites.

Best management practices are available to reduce construction- and demolition-related air quality impacts and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. Generally, these practices include watering active construction areas; covering trucks hauling materials that could spill onto paved surfaces; sweeping (with water sweepers) paved areas that are subject to vehicle traffic and on which soil materials have been deposited; stabilizing inactive construction areas; covering stockpiles; limiting vehicle speeds on unpaved areas; installing erosion control measures; and timely revegetation. All of these measures would not apply at each construction or demolition site. Generally, larger, more intensive construction or demolition projects require more comprehensive dust abatement programs than smaller, less intensive projects. Implementation of the best management practices would reduce the temporary and localized air quality impacts from construction or demolition activities to a minor level.

The 3C zone in Alternative 5 would accommodate a new transit center and/or day-visitor parking facility at either Taft Toe or Camp 6. If such a facility were developed, the effect on air quality would be beneficial by reducing vehicle-miles-traveled within the Valley, although air quality in the immediate vicinity of the transit center and/or parking facility itself would experience a minor, local, adverse effect due to the concentration of vehicular emissions in that area. The magnitude of the potential Valleywide beneficial effect would depend upon the types of technology used to transport visitors within the Valley. For instance, as a general matter, diesel-powered vehicles generate substantially greater exhaust emissions of PM-10/PM-2.5 than gasoline-powered vehicles, and the net effect of replacing gasoline-powered autos with diesel-powered buses would depend upon the number of vehicle-miles-traveled by autos that would be displaced, but could potentially be negative. However, if the National Park Service were to consider net emissions effects in the selection of the technology for expanded in-Valley shuttle service (that would naturally arise from development of a transit center and/or day-visitor parking facility at Taft Toe or Camp 6), then a moderately beneficial impact from the standpoint of Valleywide air quality would be assured.

If a transit center and/or day-visitor parking facility were developed at Camp 6, a traffic check station would be developed at Taft Toe. This traffic check station would result in a local, long-term, minor, adverse effect on air quality in the immediate vicinity of that station, due to the concentration of slow-moving and idling traffic in that area. Generally, vehicles emit greater relative amounts of air pollutants at slower speeds and when idling than when moving at higher speeds.

Under Alternative 5, the number of day-visitor parking spaces could be reduced relative to Alternative 1 because some of these spaces would be located in areas in which they would be inconsistent with the new zone designations. If parking areas were simply removed from the corridor and not relocated, long-term air quality in the Valley would be adversely affected by increased vehicular congestion from visitors searching for remaining parking spaces or parking in nondesignated areas. Such congestion would lead to a minor, adverse impact due to the localized concentration of vehicular emissions. Coordination of parking space removal with development of a transit center and/or parking facility at Taft Toe or Camp 6 would effectively remedy this impact.

Under Alternative 5, the zone designations would allow for an increase in the number of campsites in the Valley relative to the No Action Alternative. An increase in the number of campsites could have a local, minor, long-term, adverse effect by increasing the number of campfires and associated emissions; however, a redesign of a campground could also increase the number of sites without increasing campfire-related emissions by providing for group fire rings rather than providing a fire ring at each site.

Lastly, Alternative 5 could result in the relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site. Relocation of these facilities could have a local, minor, long-term, beneficial effect on air quality in the Valley by removing the associated vehicular activity from the Valley. The trade-off would be increased vehicular activity and emissions in the El Portal Administrative Site. However, depending upon the extent to which shared-ride modes would be employed to support the person-trips associated with the administrative functions and employee housing, the net effect could be beneficial, since the reduction in vehicular activity would occur in the area with greater relative traffic congestion and with higher relative visitor resource value.

Summary of Alternative 5 Impacts. Under Alternative 5, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, since no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value, and since emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with site-specific construction or demolition activities within the corridor. Over the long term, this alternative would accommodate development of a new transit center and/or day-visitor parking facility, which could result in a long-term, local, moderate, beneficial effect due to reduced vehicle travel and related emissions in the eastern part of the Valley, but which would also result in a long-term, local, minor, adverse effect in its immediate vicinity and in the vicinities of related facilities (such as the traffic check station) due to the increased concentration of vehicular activity and associated emissions at those locations.

Under Alternative 5, the zone designations would allow for an increase in the number of campsites in the Valley relative to the No Action Alternative, which could result in a local, minor, long-term, adverse effect by increasing the number of campfires and associated emissions, depending upon whether a fire ring would be provided at each campsite. Alternative 5 could also result in the relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site, which could have a local, minor, long-term, beneficial effect on air quality in the Valley by removing the associated vehicular activity from the Valley, but which could also have a corresponding adverse effect in the El Portal Administrative Site.

Cumulative Impacts

Cumulative effects to air quality discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect air

quality within the river corridor or that could be affected by air pollutant sources within the river corridor.

Past Actions. Since 1950, the population of California has tripled, and the rate of increase in vehicle-miles-traveled has increased six-fold. Air quality conditions within the park have been influenced by this surge in population growth and its associated emissions from related industrial, commercial, and vehicular sources in upwind areas as tempered by a burgeoning regulatory apparatus. Since the 1970s, emissions sources operating within the park, as well as California as a whole, have been subject to local stationary-source controls and state and federal mobile-source controls. With the passage of time, such controls have been applied to an increasing number of sources, and the associated requirements have become dramatically more stringent and complex. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles and their related emissions until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The 1990 *Fire Management Plan* was developed to address management issues related to prescribed natural burns, prescribed burns, and wildfires in the park. Implementation of the smoke management policies of the 1990 *Fire Management Plan* reduces the potential for burns or wildfires to have a major effect on air quality in the park or in the park vicinity.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both negative (short-term during construction) and potentially beneficial (long-term) effects on air quality. Short-term, construction-related effects include dust and other pollutant emissions associated with operation of construction equipment, earthmoving activities, and vehicle travel over unpaved surfaces. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which could have a long-term, beneficial impact by reducing automobile trips.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects not anticipated to have a net adverse or beneficial, long-term effect.

Examples of projects that could have a cumulative, beneficial, long-term effect on air quality include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park.
- The San Joaquin Corridor Rail Projects (DOT, Amtrak) would contribute to a long-term, beneficial impact on air quality because such improvements would encourage travel by

alternative (non-private vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.

- The Yosemite West Rezoning Application (NPS) and the Resource Management Building (NPS) are two projects that would reduce work/home commutes for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Reconstruction Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term, major, adverse impacts on local air quality primarily due to dust from construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle emissions.
- Several other regional projects that will have a net beneficial effect on air quality by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS) and the Expansion of Mariposa County Transit System.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes, and would have a beneficial, long-term effect on air quality.

Reasonably foreseeable future actions that could have an adverse effect on air quality include:

- Revisions to the 1990 *Yosemite Fire Management Plan* and development of the U.S. Forest Service's *Fire Management Action Plan for Wilderness*, which could lead to increased use of prescribed burning techniques
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects, the A-Rock Reforestation, the Fire Management Action Plan for Wilderness (USFS, Stanislaus), and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- The Wawona Campground Improvement project (NPS);
- Various development-related projects such as the Mariposa County General Plan Update; Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); and the Buildout of City of Merced, General Plan
- The Highway 41 Extension (Madera Co.), which would not be a land use development project but would remove an obstacle to land use development (and associated emissions) in the fast-growing area north of Fresno

Revisions to the 1990 *Yosemite Fire Management Plan*, the development of the *Fire Management Action Plan for Wilderness* (USFS, Stanislaus), and the fuels and reforestation projects could lead to increased use of prescribed burning techniques and could have an intermittent, long-term, adverse effect on local and regional air quality and visibility, depending upon the extent to which these projects protect air resources. The Wawona Campground Improvement (NPS) would construct additional campsites, which could result in increased local emissions from campfires, unless the overall project (which would also involve rehabilitation of an existing campground) provides for group fire rings, rather than fire rings at each campsite.

Cumulative growth in the region, and the transportation projects such as the Highway 41 Extension (Madera Co.) that support cumulative growth, would have localized, short-term, construction-related impacts; over the long term, these projects would generate emissions of ozone precursors and particulate matter primarily due to associated motor vehicle trips.

Reasonably foreseeable future actions not anticipated to have a net adverse or beneficial effect on air quality, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); and South Fork Merced River Bridges Replacement (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration Project (NPS); update to the Yosemite Wilderness Management Plan (NPS); Tamarack Campground Rehabilitation (NPS); Bridalveil Horse Camp Rehabilitation (NPS); Yosemite Creek Campground Rehabilitation (NPS); and the South Fork and Merced Wild and Scenic River Implementation Plan (USFS, BLM)
- Land exchanges, such as Yosemite View parcel land exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on air quality due to construction activities, and, in some cases, these effects would occur within the corridor. With respect to long-term effects, a distinction can be made between ozone and particulate matter. For ozone, regional emissions trends suggest that the combination of the beneficial effect of ongoing regional, state, and federal regulatory controls (particularly mobile-source control programs) with the adverse effect of existing and future land use development and associated stationary, area, and mobile emissions sources, would result in a regional, moderate, beneficial effect. That is, the beneficial effect of past and present actions that regulate stationary and mobile emissions sources and reasonably foreseeable future actions that have the potential to reduce vehicle trips and vehicle-miles-traveled would offset the adverse effect of ozone precursor emissions associated with increased cumulative growth in the region, leading to a gradual improvement in ozone air quality.

For particulate matter, the net cumulative effect is more difficult to determine, since ambient concentrations of particulate matter reflect primary (i.e., directly emitted) particles as well as secondary (i.e., derived through photochemical reactions involving precursor pollutants) particles derived from emissions of volatile organic compounds, nitrogen oxides, and sulfur oxides. One of the principal sources of directly emitted particles is entrainment of dust by vehicles moving over

paved roads, and this component of particulate matter would increase in proportion to increases in vehicle-miles-traveled associated with cumulative growth. One of the secondary sources of particulate matter, sulfur oxides, would also continue to increase with cumulative growth. In contrast, as discussed above in connection with ozone, emissions of volatile organic compounds and nitrogen oxides would continue a downward trend despite cumulative growth, and thus, their contribution to particulate matter concentrations would diminish. Furthermore, unlike ozone, which is considered a regional pollutant, particulate matter reflects both local and regional sources, and the relative influence of these two basic types of sources changes from day to day. Thus, given the opposing emissions trends and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the cumulative effect relative to particulate matter would be beneficial or adverse; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Alternative 5 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 5 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 5; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary from day to day and season to season. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 5 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Conclusions

Under Alternative 5, “air quality” would be removed as an Outstandingly Remarkable Value, but the removal would not affect air quality, because no air quality policies have been established as a direct result of its designation as an Outstandingly Remarkable Value and because emissions sources in the park would continue to be regulated pursuant to other laws and regulations. Application of the management zones for this alternative could result in short-term, local, minor (with implementation of best management practices), adverse effects associated with construction or demolition activities within the corridor. Over the long term, this alternative would accommodate development of a new transit center and/or day-visitor parking facility, which could result in a long-term, local, moderate, beneficial effect due to reduced vehicle travel and related emissions in the eastern part of the Valley, but which would also result in a long-term, local, minor, adverse effect in its immediate vicinity and in the vicinities of related facilities (such as the traffic check station or removal of existing parking areas) due to the increased

concentration of vehicular activity and associated emissions at those locations. Under Alternative 5, the zone designations would allow for an increase in the number of campsites in the Valley relative to the No Action Alternative, which could result in a local, minor, long-term, adverse effect by increasing the number of campfires and associated emissions depending upon whether a fire ring would be provided at each campsite. Alternative 5 could also result in the relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site, which could have a local, minor, long-term, beneficial effect on air quality in the Valley by removing the associated vehicular activity from the Valley but which could also have a corresponding adverse effect in the El Portal Administrative Site area.

Alternative 5 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 5 would not overlap in time and space with cumulative construction projects; thus, the local, short-term adverse effects on air quality due to construction activities could be reduced to a minor intensity with implementation of best management practices. Over the long term, with respect to ozone, conditions in the corridor would be determined almost entirely by regional emissions trends rather than by local emissions sources under Alternative 5; as discussed above, the long-term, regional effect would be moderate and beneficial, primarily due to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary on a daily and seasonal basis. Given the opposing emissions trends between primary and secondary sources of particulate matter and the varying relative contributions of regional and local emissions sources, it would be speculative to conclude that the combined effect of cumulative actions and Alternative 5 would be beneficial or adverse with respect to particulate matter; however, the opposing emissions trends would tend to diminish the magnitude of the effect, regardless of whether the effect would be beneficial or adverse.

Noise

Analysis

General Impacts. Under Alternative 5, the acoustical environment in wilderness areas would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights, and the acoustical environment in non-wilderness areas would continue to be influenced by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. The differences between noise conditions under this alternative and those under Alternative 1 would relate to the following issues: under Alternative 5, “natural quiet” would be eliminated as an Outstandingly Remarkable Value along certain river segments; construction or demolition activities could occur; a centralized transit center and/or day-visitor parking facility could be developed; and certain administrative functions and employee housing could be relocated from Yosemite Valley to the El Portal Administrative Site.

Under Alternative 5, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along those segments of the main stem of the Merced River (wilderness) and

the South Fork (wilderness and below Wawona) for which “natural quiet” is currently listed as an Outstandingly Remarkable Value. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Natural quiet has been removed as an Outstandingly Remarkable Value because it is not river-related nor is its presence in the corridor unique to the region or nation.

However, the removal would have a local, negligible, long-term, adverse effect on noise, since one important aspect of this environmental condition—the enjoyment of natural river sounds—has been integrated into the recreation Outstandingly Remarkable Values for each of the three applicable river segments. As such, that particular aspect would continue to be considered for both protection and enhancement. Also, for the two segments in designated Wilderness areas, noise sources would continue to be regulated through implementation of policies contained in the 1989 *Wilderness Management Plan*, such as the wilderness permit system and restrictions on aircraft and snowmobile use. Although the third river segment for which “natural quiet” would no longer be an Outstandingly Remarkable Value (below Wawona) would not be located in a designated Wilderness area, it would be designated 2A+ under this alternative; this designation would essentially eliminate the potential for noise impacts since, as undeveloped open space, new development and related noise sources would generally not be allowed.

The application of management zones under this alternative would ensure that essentially no new human-caused noise sources would be introduced along segments of the corridor that would lie in wilderness areas. Thus, Alternative 5 would have essentially no effect on the noise environment in wilderness areas.

In non-wilderness areas under this alternative, some facilities could be constructed and other facilities removed based on the new management zoning designations. Construction or demolition activities could generate substantial amounts of noise during the temporary construction period. The noise levels generated by typical pieces of construction equipment are shown in table IV-1 under Alternative 2.

At each individual construction or demolition site, the related noise impact would vary depending upon a number of factors, such as the number and types of equipment in operation on a given day, their usage rates, the level of background noise in the area, and the distance between sensitive uses and the construction site. However, in general, given the low background noise levels away from park roadways and the expectation of visitors that the environment be free of excessive noise sources (if not natural quiet), the impact from construction or demolition activities would generally be local, major, short-term, and adverse.

Best management practices are available to reduce noise impacts from equipment associated with construction or demolition activities and could be made conditions of agreements with contractors. These practices are listed in Chapter II and are common to all action alternatives. With each individual construction or demolition project, these best management practices would need to be refined and balanced against other resource goals, such as protection of wildlife.

Implementation of best management practices would generally reduce the related impacts from major to moderate, given the temporary nature of construction or demolition projects.

Alternative 5 would accommodate the potential development of a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6, since those areas would be designated as zone 3C. If such a facility were developed, the effect on noise would be beneficial by reducing vehicle-miles-traveled within the Valley, although the immediate vicinity of the transit center and/or parking facility itself would experience adverse effects. Once operational, noise impacts from the concentration of vehicular activity in that area would be moderate and long term. The geographic extent of adverse local noise impacts related to the transit center and/or parking facility would depend upon the acoustical characteristics of the topography in the surrounding area (e.g., bowl or echo effects), and such characteristics should be taken into account in the development of any such facility.

The intensity of the potential beneficial effect in the eastern portion of the Valley would depend upon the types of technology used to transport visitors within the Valley. For instance, as a general matter, diesel-powered shuttle buses would generate substantially more noise than the autos they would be replacing, and the net effect of replacing autos with diesel-powered shuttle buses would depend upon the number of vehicle-miles-traveled by autos that would be displaced. However, electric shuttle buses generate substantially less noise than diesel buses, and if the National Park Service were to consider noise effects in the selection of the technology for expanded in-Valley shuttle service (that would naturally arise from the potential development of a transit center and/or day-visitor parking area at Taft Toe or Camp 6), then a minor to moderate, beneficial impact from the standpoint of noise levels in the eastern portion of the Valley would be expected.

If a transit center and/or day-visitor parking facility were developed at Camp 6, a traffic check station would be developed at Taft Toe. This traffic check station would result in a local, long-term, adverse effect on noise in the immediate vicinity of that station. The effect would be minor given that the same volume of traffic would pass through this area with or without the traffic check station, whether traffic proceeds eastbound or westbound. West of the station, roadside noise levels would be reduced, since eastbound traffic would decelerate in their approach to the station and since vehicles generate less noise at lower speeds. East of the station, roadside noise levels would be higher, since eastbound traffic would accelerate back to the speed limit and since accelerating vehicles generate relatively high noise levels.

Lastly, Alternative 5 could result in the relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site. Relocation of these facilities could have a local, minor, long-term, beneficial effect on the ambient noise environment in the Valley by removing the associated vehicular activity from the Valley. The trade-off would be increased vehicular activity and an adverse noise impact of similar intensity and duration at the El Portal Administrative Site. However, depending upon the extent to which shared-ride modes would be employed to support the person-trips associated with the administrative functions and employee housing, the net effect could be beneficial, since the reduction in vehicular activity would occur in the area with higher relative visitor resource value.

Summary of Alternative 5 Impacts. Under Alternative 5, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness Management Plan*; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 5 but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Under Alternative 5, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Alternative 5 would also allow for the development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station) and relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site, which would result in a minor to moderate, long-term, adverse noise effect in the vicinity of the new or relocated facilities themselves, due to the concentration of vehicular activity and related noise, but would also result in a long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and their related noise. The intensity of this potential long-term, beneficial effect could be minor to moderate, depending upon the types of technology used to transport visitors within the Valley.

Cumulative Impacts

Cumulative effects to the ambient noise environment discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect noise within the river corridor or could be affected by noise sources within the corridor.

Past Actions. Development of facilities that include various sources of noise has occurred in and near some segments of the river corridor. Such facilities include roadways, campgrounds, and administrative buildings. Generally, these facilities were developed with limited consideration of potential noise impacts. From a regulatory standpoint, relevant state and federal noise standards typically apply to individual types of noise sources, such as automobiles and buses, rather than to overall noise levels, but the National Park Service has adopted two plans, a Restricted Access Plan and the *Wilderness Management Plan*, that indirectly affect overall noise levels in the river corridor. The Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the indirect effect of limiting the amount of vehicle noise during peak periods by restricting the number of incoming vehicles until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

The *Wilderness Management Plan* was developed to preserve a wilderness environment in which the natural world along with the processes and events that shape it are largely untouched by human interference. Implementation of the permit system for overnight camping under the *Wilderness Management Plan* reduces potential noise impacts in those areas where natural quiet is an important element of the visitor experience.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on noise. Short-term, construction-related effects include noise from heavy equipment operations. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which may have a long-term, beneficial impact by replacing automobile trips with a fewer number of transit vehicle trips, depending upon transit ridership levels and the technology used for transit vehicles.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial, long-term effect; (2) projects anticipated to have a net adverse, long-term effect; and (3) projects anticipated not to have a net adverse or net beneficial, long-term effect.

Cumulative projects that could have a net, beneficial, long-term effect on the ambient noise environment include:

- The Yosemite Area Regional Transportation System (YARTS) is a collaborative, multiagency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion.
- Passenger rail improvements in the Amtrak San Joaquin Corridor (DOT, Amtrak) and potential creation of high-speed rail service would encourage travel by alternative (nonprivate vehicle) modes, particularly if combined with the potential expansion of regional transit service proposed by YARTS.
- The Yosemite West Rezoning Application (NPS) and the Resource Management Building (NPS) are two projects that would reduce in-Valley vehicle trips for some employees.
- The *Yosemite Valley Plan* (NPS) proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.
- The *Yosemite Valley Plan* (NPS) also includes safety improvements on Segment D of the El Portal Road Improvement Project (i.e., the segment from Cascades Diversion Dam [near the El Portal Road/Big Oak Flat Road intersection] to the Pohono Bridge). Construction activity on Segment D would cause short-term adverse impacts on the local noise environment primarily due to construction activities, similar to those currently occurring during construction on Segments A, B, and C. Those adverse impacts associated with

Segment D construction activity could be mitigated by implementation of best management practices. Safety improvements on Segment D of El Portal Road, together with improvements on Segments A, B, and C, would facilitate expanded regional transit service on that route, and expanded transit could lead to fewer vehicles and less vehicle noise.

- Several other regional transportation projects that would have a net beneficial effect on noise by improving the relative attractiveness of alternative modes of transportation and thereby reducing private automobile vehicle trips include the Yosemite Valley Shuttle Bus Stop Improvements (NPS), and the Expansion of Mariposa County Transit System (Mariposa Co.).
- Update to the National Park Service's 1989 *Yosemite Wilderness Management Plan*.

Although most of the aforementioned projects would have localized, short-term, adverse effects (e.g., construction-related effects), the general goal of each of these projects is to improve regional transportation, circulation, and safety. As such, these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would therefore have a beneficial, long-term effect on the ambient noise environment.

To the extent that the transportation-related projects cited above would replace automobile trips in the Valley with bus trips, the anticipated beneficial effect would depend upon ridership levels (and the corresponding number of automobile trips that would be avoided) and the technology selected for the buses. While a bus generates higher maximum noise levels than an automobile, a shift from auto to bus trips would reduce average roadside noise levels, assuming a certain number of auto trips would be displaced. For instance, a typical diesel-powered bus generates the same amount of noise as approximately 6 to 50 typical automobiles at speeds of 40 miles per hour or less (the difference between bus and auto noise is inversely related to speed), based on data compiled by the U.S. Department of Transportation (FHWA 1995). Assuming that a typical electric bus generates approximately 6 dBA less than a typical diesel bus, an electric bus generates the same amount of noise as approximately 2 to 13 typical automobiles. Thus, these projects have the potential to contribute to a cumulative beneficial effect in the Valley, but also have the potential to offset some of the benefit with a combination of low ridership levels and typical diesel bus technology.

Implementation of an update to the *Yosemite Wilderness Management Plan* (NPS) would have a net beneficial, long-term effect on the ambient noise environment in the Merced River corridor because of the emphasis on improving visitor use management as it relates to naturally functioning ecosystems and a quality diverse wilderness experience.

Cumulative projects that could have a net, adverse, long-term effect on the ambient noise environment include:

- Various development-related projects, such as the Mariposa County General Plan Update (Mariposa Co.); Hazel Green Ranch (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan
- Wawona Campground Improvement (NPS)

Cumulative growth in the region would have localized, short-term, construction-related impacts; over the long term, these projects would have an adverse effect on local roadside noise levels due

to increased vehicle trips. The Wawona Campground Improvement project would construct an additional campground, which may result in increased noise in Section 35.

Reasonably foreseeable projects not anticipated to have a net adverse or beneficial effect on the ambient noise environment, other than short-term, localized impacts due to construction activities, include:

- Infrastructure and transportation projects, such as Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); South Fork Merced River Bridges Replacement (NPS); El Portal Road Improvement Project (NPS)
- Several Yosemite campground rehabilitation and resource restoration projects and plans, such as Merced River at Eagle Creek Ecological Restoration; Bridalveil Horse Camp Rehabilitation; and Yosemite Creek Campground Rehabilitation (NPS)
- Land exchanges, such as Yosemite View parcel land exchange, El Portal (NPS) and Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS)

Many of the above cumulative projects would result in local, short-term, major, adverse effects on the ambient noise environment due to construction activities, and in some cases, these effects would occur within the corridor. Over the long term, statewide growth and development would accelerate the national trend in increased air travel, resulting in a local, minor, long-term adverse effect in some portions of the corridor in wilderness areas due to increased aircraft overflights and associated intrusive noise levels. In non-wilderness areas, cumulative actions that would provide for increased transit use and reduced automobile use or that would reduce vehicle trips in the Valley could result in a local, minor, long-term, beneficial effect within the corridor depending upon the type of technology used for transit purposes and the extent to which private automobile trips are diverted to transit.

Alternative 5 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 5 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 5; as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the cumulative actions that would tend to reduce motor vehicle trips, and the potential development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station) and relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site under this alternative would result in a moderate, long-term, adverse effect on noise levels in the immediate vicinities of new or relocated facilities, due to the concentration of vehicular activity, but could result in a minor to moderate, long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and related noise, depending upon the type of technology used for transit purposes.

Conclusions

Under Alternative 5, “natural quiet” would be removed from the list of Outstandingly Remarkable Values along segments of the main stem of the Merced River and South Fork, but this action would have a local, negligible, long-term, adverse effect on noise for the following reasons: “enjoyment of natural river sounds” would be integrated into the recreation Outstandingly Remarkable Values for those same river segments; noise sources in wilderness areas would continue to be regulated through implementation of policies in the 1989 *Wilderness Management Plan*; and the one affected non-wilderness segment, below Wawona, would be designated zone 2A+.

The acoustical environment in wilderness areas would not be affected by Alternative 5, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in non-wilderness areas would continue to be shaped by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Under Alternative 5, construction or demolition activities could result in a moderate, short-term, adverse effect on noise levels (assuming implementation of best management practices) within the corridor in the immediate vicinities of the construction or demolition sites. Alternative 5 would also allow for the development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station) and relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site, which would result in a minor to moderate, long-term, adverse noise effect in the vicinity of the new or relocated facilities themselves, due to the concentration of vehicular activity and related noise, but would also result in a long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and their related noise. The intensity of this potential, long-term, beneficial effect could be minor to moderate, depending upon the types of technology used to transport visitors within the Valley.

Alternative 5 could contribute to the cumulative number of construction sites in and near the corridor; in most instances, construction projects undertaken as part of Alternative 5 would not overlap in time and space with cumulative construction projects, and thus, the local, short-term adverse effects on noise due to construction activities could be reduced to a moderate intensity with implementation of best management practices. Over the long term, in wilderness areas, noise impacts in the corridor would be determined almost entirely by cumulative trends in air travel rather than by in-park noise sources under Alternative 5; as discussed above, the national trend in air travel would result in a local, minor, long-term, adverse effect on the ambient noise environment. In non-wilderness areas, the cumulative actions that would tend to reduce motor vehicle trips, and the potential development of a transit center and/or day-visitor parking facility (and, possibly, a related traffic check station) and relocation of certain administrative functions and employee housing from the Valley to the El Portal Administrative Site under this alternative would result in a moderate, long-term, adverse effect on noise levels in the immediate vicinities of new or relocated facilities, due to the concentration of vehicular activity, but could result in a minor to moderate, long-term, beneficial effect in the eastern portion of the Valley due to reduced vehicle trips and related noise, depending upon the type of technology used for transit purposes.

Cultural Resources

General Impacts. Cultural resource Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those cultural resources that are not related to the Merced River, are not unique to the region or nation, or do not accurately reflect site conditions have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *Yosemite General Management Plan*, *Yosemite Resources Management Plan*, 1999 Programmatic Agreement), as well as by federal law (e.g., National Historic Preservation Act and Archeological Resources Protection Act).

Cultural resource Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) now include river-related cultural resources that are either eligible for or listed in the National Register of Historic Places that are not intended to divert the free flow of the river. The revised Outstandingly Remarkable Values are more inclusive than those in the 1996 *Draft Yosemite Valley Housing Plan* and provide greater focus on the Merced River and resources unique to the region or nation.

Archeological Resources

Analysis

Under the application of management elements for Alternative 2, there is a potential that earthmoving activities would be required as part of construction and/or development. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The proposed management zoning designations for the wilderness areas of the Merced River corridor would not allow for development of any new facilities. Therefore, impacts to archeological resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to adversely affect entire sites or portions of sites by disturbing intact archeological resources, which are identified as an Outstandingly Remarkable Value. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance, and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. Where such avoidance were not feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impacts.

Yosemite Valley. The 3C zone could allow for the development of a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6. In addition, the 3B and 3C zones could allow construction of new facilities and hardened surfaces (e.g., overnight accommodations, parking areas, and park operations and maintenance) and the removal or relocation of existing facilities. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed and possibly destroyed. Although the intensity of impact would depend partly upon the nature and location of the undertaking, extensive grading and ground disturbance could result in a local, long-term, moderate to major, adverse impact to archeological resources.

The 2B, 2C, and 3A zones could allow construction of new facilities and hardened surfaces (e.g., campgrounds, trails, parking areas, restrooms, and picnic areas) and the removal or relocation of existing facilities. Development within these management zones also could concentrate visitor use at specific locations in the Valley, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. Although the intensity of impact would depend partly upon the nature and location of the undertaking, grading and ground disturbance could result in a local, long-term, minor to moderate, adverse impact to archeological resources.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, the park would conduct data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact. Every effort would be made to avoid adverse impacts wherever possible.

Merced River Gorge. Under Alternative 5, the management zoning designations allow for construction of facilities, such as trails, parking areas, restrooms, and picnic areas, within the Merced River gorge. If such construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. These potential actions also could concentrate visitor use, thereby resulting in impacts such as trampling, surface collection, and erosion. However, by establishing a site monitoring program and by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, reducing the likelihood of visitor-related damage. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological sites would be avoided wherever possible. Where such

avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impacts.

El Portal. The 3C zone could allow for the development of facilities or the removal of existing facilities. If this development or removal occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The 2C zone could allow for construction of new facilities and hardened surfaces and the removal or relocation of existing facilities. Development within this management zone also could concentrate visitor use at specific locations in El Portal, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, the park would conduct data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impact. Every effort would be made to avoid adverse impacts wherever possible.

Wawona. Under Alternative 5, the 3A, 3B, and 3C zoning designations allow for the potential development, maintenance, rehabilitation, or removal of facilities in the Wawona area. If these activities occurred and earthmoving activities were required, intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

The 2B and 2C zones could allow construction of new facilities and hardened surfaces and the removal or relocation of existing facilities. Development within these management zones also could concentrate visitor use at specific locations in Wawona, which could affect archeological resources by causing trampling, surface collection, and erosion. However, by providing more structured visitor experiences in the river corridor, use could be directed away from known archeological resources, which would reduce the likelihood of visitor-related damage. If this development or construction occurred and earthmoving activities were required, then intact archeological resource(s), which are identified as an Outstandingly Remarkable Value, could be disturbed. This is considered a local, long-term, minor to major, adverse impact, and the intensity

of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Under this agreement, disturbance to archeological resources would be avoided wherever possible. Where such avoidance would not be feasible or prudent, the park would implement data recovery excavations to retrieve important scientific information, thereby reducing the intensity of the impacts.

Summary of Alternative 5 Impacts. The implementation of potential future actions under the management zones of Alternative 5 would result in a long-term, major, adverse impact to archeological resources due to the potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value. The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Cumulative Impacts

Cumulative impacts to archeological resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect archeological resources within the river corridor or in the park vicinity.

Past Actions. Archeological resources are subject to damage from development, vandalism, visitor access, and natural processes. For example, the 1997 flood exposed portions of two archeological resources in El Portal.

In general, the archeological resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous archeological resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. There are archeological resource sites in Yosemite Valley, El Portal, and Wawona that are considered to be at risk from existing facility development. These sites are at or adjacent to trails, structures, utility systems, and other facilities and are subject to ongoing

disturbances such as trampling, surface collection, and ground disturbance associated with facility maintenance.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on archeological resources in the vicinity include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS), which will address land management issues within the wilderness
- The *Yosemite Valley Plan* (NPS)
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- South Entrance/Mariposa Grove Site Planning (NPS)
- Resources Management Building, Yosemite West Rezoning Application, South Fork Merced River Bridges Replacement (NPS)
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS), Hazel Green Ranch (Mariposa Co.), Crane Flat Campus Redevelopment (NPS, YNI), Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Resources Management Building (NPS); Yosemite West Rezoning Application (NPS); and the Hazel Green Ranch (Mariposa Co.)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridge Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Merced River Canyon Trail Acquisition (BLM)

The extensive grading and ground disturbance that could be required for these projects could disturb individual archeological resources. Each of these projects is within an archeologically sensitive area, such as a river valley or a mountain meadow. Specific impacts would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, major, adverse impact on archeological resources.

Conclusions

The implementation of potential future actions under the management zones of Alternative 5 would result in a long-term, major, adverse impact to archeological resources due to the potential earthmoving activities that could disturb intact archeological resources, some of which are identified as an Outstandingly Remarkable Value. The intensity of impact would depend upon the nature, location, and design of the facility to be developed or removed as well as the quantity and data potential of the archeological resource(s) affected.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, major, adverse impact on archeological resources.

Ethnographic Resources

Analysis

Under the application of management elements for Alternative 5, there is a potential that ethnographic resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The management zoning designations for wilderness areas of the Merced River corridor would not allow for the development of any new facilities. Therefore, impacts to ethnographic resources only would occur as a result of ongoing park operations and programs, such as facilities maintenance and repair. The intensity of impact would depend on the nature, location and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement and the cooperative agreement for traditional uses. Every effort would be made to avoid adverse impacts to ethnographic sites. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Yosemite Valley. The management zoning designations under Alternative 5 could allow for development of new facilities and hardened surfaces (e.g., a transit center and/or day-visitor

parking facility, trails, parking areas, restrooms, and picnic areas) and removal and relocation of existing facilities. If these actions were to occur, then ethnographic resources, which are identified as Outstandingly Remarkable Values, could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as quantity and nature of the ethnographic resources affected.

Any such action would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. The park, in consultation with the culturally associated Indian tribes, would make every effort to avoid impacts to ethnographic resources. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

The general increase in visitors to the park would increase the potential that American Indians would be discouraged from using traditional gathering areas within the Valley. However, this alternative would provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas. Compared to Alternative 1, this alternative would reduce the likelihood of impacts to ethnographic resources and would provide a long-term, minor, beneficial impact.

Merced River Gorge. The management zoning designations in the Merced River gorge could allow for construction of facilities, such as trails, parking areas, restrooms, and picnic areas at the Cascades area. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park, in consultation with the culturally associated Indian tribes, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

El Portal. The management zoning designations for portions of the river corridor in El Portal could allow for development of new facilities, construction of other facilities (e.g., park operations, employee housing, trails, parking areas, restrooms, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of impact would depend upon nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance would not be possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Wawona. The management zoning designations for portions of the river corridor through Wawona could allow for ongoing maintenance and rehabilitation of facilities, construction of other facilities (e.g., trails, parking areas, restrooms, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, ethnographic resources could be affected by disturbing or destroying traditional use areas or changing access to these places, disturbing historic village sites, or adding or increasing visitation in spiritual places. This is considered a local, long-term, minor to major, adverse impact, and the intensity of the impacts would depend upon the nature, location, and design of the undertaking as well as the quantity and nature of the ethnographic resources affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. The park would continue to consult with culturally associated Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses and would avoid adverse impacts wherever possible. Where avoidance is not possible, the park would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impact. Mitigation could include identification of and assistance in accessing alternative resource gathering areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas.

Summary of Alternative 5 Impacts. Alternative 5 would provide more structured visitor experiences in the Merced River corridor and would direct visitors away from traditional gathering areas in the corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential

future actions that could occur under the management zones of Alternative 5, which is considered to be a local, long-term, minor to major, adverse impact.

Cumulative Impacts

Cumulative impacts to ethnographic resources discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect ethnographic resources within the river corridor or in the park vicinity.

Past Actions. Ethnographic resources and their traditional cultural associations have been lost or damaged in Yosemite National Park through past development, visitor use, natural events, and widespread disruption of cultural traditions. Nevertheless, Yosemite National Park retains many sites and resources of significance to local and culturally associated American Indians.

In general, the ethnographic resources within the Merced River corridor are the result of thousands of years of human occupation. Development of facilities within the river corridor has disturbed or destroyed numerous ethnographic resources and compromised the integrity of numerous other such resources.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. No present actions have been identified that would affect ethnographic resources in the vicinity of the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects that could adversely affect ethnographic resources; (2) projects that could beneficially affect ethnographic resources; and (3) projects that could either adversely or beneficially affect ethnographic resources.

Examples of projects that could have a cumulative, adverse effect on ethnographic resources include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, the White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, Replacement/Rehabilitation of Yosemite Valley Sewer

Line (NPS), Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)

- The Orange Crush Fuels Treatment Projects (USFS, Stanislaus)
- Transportation projects, such as the Highway 41 Extension (Madera Co.); Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS); Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.); Expansion of Mariposa County Transit System; Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Evergreen Road Improvements (multi-agency, see Appendix G); San Joaquin Corridor Rail Projects (DOT, Amtrak)
- Various development-related projects such as, the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); and Resources Management Building (NPS)
- Merced River Canyon Trail Acquisition (BLM)

All of these projects could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places. These projects would have a long-term, adverse impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were damaged and access to traditional use places were facilitated.

Reasonably foreseeable projects that would beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)
- The Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Update to the *Yosemite Fire Management Plan* (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses (USFS); both of which will address ecosystem management issues of Forest Service lands adjacent to Yosemite National Park
- *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- The Pinecrest Basin Forest Plan Amendment (USFS, Stanislaus)
- A-Rock Reforestation (USFS, Stanislaus) and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

These projects could result in restoring native plant habitat, which would be a long-term, beneficial impact on ethnographic resources. The intensity of this impact would depend on the extent to which gathering sites were restored and access to traditional use places were facilitated.

Reasonably foreseeable projects that would adversely or beneficially affect ethnographic resources in the vicinity of the Merced River corridor include:

- *The Yosemite Valley Plan* (NPS)

The preferred alternative of the *Yosemite Valley Plan* could adversely affect ethnographic resources by damaging gathering sites and historic villages or restricting access to traditional use places, and could beneficially affect ethnographic resources by restoring native plant habitat.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Conclusion

Alternative 5 would provide more structured visitor experiences in the Merced River corridor and could direct visitors away from traditional gathering areas in the corridor. This would reduce the likelihood of impacts to ethnographic resources and would improve conditions for the recovery of traditionally used plants. This long-term, minor to moderate, beneficial impact could be offset by the implementation of potential future actions that could occur under the management zones of Alternative 5, which is considered to be a local, long-term, minor to major, adverse impact.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in both a long-term, minor, beneficial impact on ethnographic resources (through the management of natural resources and river processes) and in a long-term, adverse impact on ethnographic resources (by damaging gathering sites or restricting access to traditional use places). The type and intensity of the impact would depend upon design and final locations of proposed facilities.

Cultural Landscape Resources, including Historic Sites and Structures

Analysis

Under the application of management elements for Alternative 5, there is a potential that cultural landscape resources could be affected. The following discussion provides an overview of the types of impacts that could occur within each segment of the Merced River corridor.

Wilderness. The management zoning designations for the wilderness areas of the Merced River corridor would not allow development of new facilities. Therefore, impacts to cultural landscape resources would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. These actions have the potential to adversely affect cultural landscape

resources, which are classified as an Outstandingly Remarkable Value. Impacts would be associated with maintenance activities that remove historic fabric, remove historic structures, or add incompatible facilities within or adjacent to historic structures. The intensity of impact would depend upon the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that are affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Yosemite Valley. The Merced River, its adjacent riparian corridor and meadows, and viewsheds are considered to be important elements of the Yosemite Valley cultural landscape historic district. The management zones could allow for the protection and enhancement of these elements of the cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in protecting and/or enhancing the character-defining features of a historic property, and the number of contributing elements of a historic district that were protected and/or enhanced.

The management zoning designations for portions of the river corridor in Yosemite Valley could result in the development of new facilities (e.g., a transit center and/or day-visitor parking facility, campgrounds, trails), relocation or removal of existing facilities, the redesign of developed areas (e.g., Yosemite Lodge, Curry Village, Yosemite Village), and changes to the historic cultural landscape and cultural landscape resources. Any of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the Valleywide cultural landscape, result in the removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Merced River Gorge. The management zoning designations under Alternative 5 could allow for construction of facilities (e.g., trails, parking areas, restrooms, Cascades residences, and picnic areas). If these actions were to occur, then cultural landscape resources could be adversely affected by removing resources or by adding incompatible facilities within or adjacent to cultural

landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts prove impossible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

El Portal. The management zoning designations for the river corridor in El Portal could allow for construction of facilities (e.g., trails, parking areas, restrooms, park operational facilities, and picnic areas), and removal or relocation of existing facilities. If these actions were to occur, then cultural landscape resources could be adversely affected by removing historic structures or by adding incompatible facilities adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Wawona. The management zoning designations in the river corridor in Wawona could allow for construction of facilities (e.g., trails, parking areas, restrooms, and picnic areas) and removal or relocation of existing facilities. If these actions were to occur, then cultural landscape resources could be adversely affected by removing or altering historic fabric, removing historic structures, or by adding incompatible facilities within or adjacent to cultural landscape resources. The intensity of impact would depend upon the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

These actions would be subject to site-specific planning and compliance and would be undertaken in accordance with stipulations in the park's 1999 Programmatic Agreement. Every effort would be made during the design phase to avoid adverse impacts. These efforts could include screening and/or sensitive design that would be compatible with cultural landscape resources. Should avoidance of adverse impacts not be possible, documentation and treatment stipulated in the 1999 Programmatic Agreement would reduce the intensity of the impacts.

Summary of Alternative 5 Impacts. Under Alternative 5, the zoning designations could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning

designations could allow for the development of new facilities, the relocation or removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Cumulative Impacts

Cumulative impacts to cultural landscape resources discussed herein are based on analysis of the effects of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect cultural landscape resources within the river corridor or in the park vicinity.

Past Actions. Cultural landscape resources have been lost or damaged in Yosemite through past development, visitor use, and natural events. In wilderness areas, cultural landscape resources include remnants of early stock grazing, trails, and work camps. In Yosemite Valley, Wawona and El Portal, cultural landscape resources include early hotels, bridges, stores, studios, cabins, farms, and railroad structures that were associated with early Euro-American pioneer settlement and industries. In the Merced River gorge, cultural landscape resources include segments of the early wagon road and engineering projects. Rapidly disappearing structures and sites in other areas include homestead cabins, barns, road and trail segments, bridges, mining complexes, railroad and logging facilities, blazes, and campsites. These resources are reminders of the area's ranching, grazing, lumbering, and mining history.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and affects cultural landscape resources within the Merced River gorge. Cultural landscape resources are protected during construction by implementation of a compliance monitoring program.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could affect cultural landscape resources include:

- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Wawona Campground, Tamarack Campground, Yosemite Creek Campground, and Hodgdon Meadow Campground (NPS)
- The *Yosemite Valley Plan* (NPS)

- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- The Yosemite View parcel land exchange, El Portal (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- The Update to the *Yosemite Wilderness Management Plan*(NPS)
- Several water improvement projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Merced River Canyon Trail Acquisition (BLM)
- The update to the *Yosemite Fire Management Plan* (NPS)

Given that each of these actions could result in removal of historic fabric or resources, add noncontributing elements to the historic cultural landscape, or add incompatible facilities within or adjacent to a cultural landscape resource, these cumulative projects would have a long-term, adverse impact on cultural landscape resources. The impact intensity of any planning projects would depend upon the extent to which the plan's recommendations were implemented.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

Conclusion

Under Alternative 5, the zoning designations could allow for the protection and/or enhancement of elements of the Yosemite Valley cultural landscape historic district. This would be a long-term, minor to moderate, beneficial impact. Conversely, the zoning designations could allow for the development of new facilities, the relocation or removal of existing facilities, or the redesign of developed areas. Any or all of these actions could disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within or adjacent to a cultural landscape resource. The intensity of impact would depend on the nature, location, and design of the undertaking, the measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that were affected.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to major, adverse impact on cultural landscape resources in Yosemite National Park because these projects would, individually and in combination, disrupt historical circulation and land use patterns, add noncontributing elements to the cultural landscape, result in removal of historic fabric or resources, or add incompatible facilities within

or adjacent to a cultural landscape resource. The intensity of the impact would depend on the implementation of various projects that would affect cultural landscape resources.

National Historic Preservation Act Section 106 Summary

Under regulations of the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800.9) that address the criteria of effect and adverse effect, the zoning designations and River Overlay Protection proposed under this alternative would allow (but do not prescribe) actions that have the potential to adversely affect significant properties. The National Park Service has determined that selection of this alternative would result in “no effect” to historic properties listed in or eligible for listing in the National Register of Historic Places. The California State Historic Preservation Officer has concurred with this determination.

Visitor Experience

Analysis

General Impacts. Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information, changed ecological and hydrologic conditions in the river corridor, and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River (e.g., rock climbing) or not unique to the region or nation (e.g., rainbow trout) have been removed. Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan* and *Resources Management Plan*), as well as by federal law (e.g., the National Park Service Organic Act). Visitor experience Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) include activities such as river-related hiking, picnicking, and opportunities for solitude and enjoyment of natural river sounds and the scenery of riverine habitats, such as riparian forests, meadows, and the aquatic environment.

The revised Outstandingly Remarkable Values provide greater focus on the Merced River those presented in the 1996 *Draft Yosemite Valley Housing Plan*. Alternative 5 management zoning, in combination with the implementation of Visitor Experience and Resource Protection (VERP) proposed under this alternative (refer to discussions of specific areas below), would provide increased protection for these Outstandingly Remarkable Values compared to the absence of zoning in the No Action Alternative.

Implementation of the VERP framework would have an overall beneficial impact on all recreation Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is designed to protect and enhance the quality of the visitor experience. Over the long term, implementation of VERP could have a beneficial impact to visitor experience because it would protect the visitor experience from adverse impacts associated with visitor use.

For example, if the number of encounters along a segment of trail were selected as an indicator of desired visitor experience, violation of the standard associated with this indicator would result in management action to manage or limit visitor use in the area. The management action could be to redirect some visitors to trails where the standard is not being violated, or to reduce the frequency of shuttle bus stops at the trailhead. This action would have a beneficial impact by discontinuing further visual and ecological degradation of the trail segment and thus protecting the future enjoyment of the trail.

Implementation of the VERP framework would manage visitor use in the Merced River corridor in Yosemite National Park. Because the management actions necessary to protect the visitor experience and natural resources are unknown, and it is uncertain how protecting the visitor experience and resources would specifically affect visitor experience in the Merced River corridor, analysis of the impacts of implementation of VERP on overall Yosemite visitation, and thus the accessibility to recreational opportunities, the wilderness, interpretation and orientation facilities, or visitor services, would be speculative. Before new management action were taken, a determination would be made as to whether preparation of environmental documentation to comply with the provisions of the National Environmental Policy Act or other applicable legislation would be required to assess the effects of this action on the environment – including visitor experience opportunities.

Recreation

Analysis

The following discussion provides an overview of the types of impacts to recreation resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor reflects current management practices and use levels based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The zoning is not anticipated to alter the recreational experience or use patterns of these areas compared to the No Action Alternative. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Consequently, the application of management zoning within wilderness segments would have no effect on the recreation experience within the wilderness.

Outstandingly Remarkable Values within wilderness segments include opportunities for solitude along the river with primitive and unconfined river-related recreation (e.g., day hiking, backpacking, fishing, horseback riding and packing, camping, and enjoyment of natural river sounds). Effects to recreation-related Outstandingly Remarkable Values within wilderness portions of the Merced River are considered beneficial under this alternative, because the

proposed management zoning would protect the quality of recreational opportunities while precluding new development that could reduce this quality or its availability.

Impacts in Yosemite Valley. Recreation Outstandingly Remarkable Values of Yosemite Valley include opportunities to experience a spectrum of river-related recreational activities, from nature study and sightseeing to hiking. Yosemite Valley is one of the premier outdoor recreation areas in the world. Implementation of management zoning and VERP under this alternative would protect and enhance these Outstandingly Remarkable Values.

Alternative 5 would generally allow for visitor access to the Merced River corridor similar to Alternative 1, due in large part to the absence of the River Protection Overlay found in other alternatives and the predominance of 2C, 2D, 3A, and 3B zoning in east Yosemite Valley. Without the River Protection Overlay as a management tool, the park would have less ability to protect sensitive areas and instead could more completely retain the diversity and availability of recreational opportunities currently available. Application of 2C, 2D, 3A, and 3B management zoning protects the opportunity for a diversity of recreational experiences along the length of Yosemite Valley – from solitude, group activities, challenge, and access. This protected access to diverse experiences would result in a long-term, moderate, beneficial impact.

Application of 2C management zoning under Alternative 5 in east Yosemite Valley supports more active, intensive recreational activities than would be allowed in other parts of the corridor (such as 2B zones). As a result, visitor activities could be distributed more evenly throughout the 2C zones, resulting in less crowding in some areas and more in other areas.

Application of 2B management zoning in west Yosemite Valley would direct visitor use to areas better able to withstand use (e.g., Sentinel Beach, El Capitan Picnic Area – zoned 2C). Visitor access would therefore be less self-directed than at present. Application of management zoning would also provide for protection and restoration efforts to take place in the Merced River corridor.

Under Alternative 5, the majority of recreational opportunities could continue (e.g., swimming and wading, hiking, backpacking, rock climbing, fishing, sightseeing, photography, nature study, bicycling, and stock use), subject mostly to adjustment due only to VERP monitoring. The trail system would remain unaffected by zoning but could require adjustment over time as a result of VERP monitoring.

Certain other activities, however, could be somewhat restricted under Alternative 5. Application of management zoning could limit development of additional launch and removal facilities for non-motorized watercraft (e.g., rafts, inner tubes, kayaks) to areas zoned 2C. For example, facilities to launch non-motorized watercraft could be directed to areas zoned 2C, such as portions of east Yosemite Valley, Sentinel Beach, and Cathedral Beach, as opposed to current management practices, which do not constrain where watercraft can be launched. However, rafting itself (or the use of other non-motorized watercraft) would not be managed directly by this alternative. The possible limitations on placement of non-motorized watercraft launch facilities would have a long-term, negligible, adverse impact on the diversity of recreational opportunities available in Yosemite Valley.

With the predominance of 2C, 2D, 3A, 3B, and 3C zoning in Yosemite Valley, opportunities for solitude and quiet in the Valley would likely be limited to areas zoned 1A and 2B in portions of Yosemite Valley. Opportunities for solitude and quiet in Yosemite Valley in 1A and 2B zones would constitute a long-term, negligible, beneficial impact of Alternative 5, as compared to opportunities for solitude under Alternative 1, which has no such management zoning.

In Yosemite Valley, Alternative 5 could result in a local, long-term, minor, beneficial impact to visitor experience because the management zoning protects the opportunity for a diversity of recreational experiences along the length of Yosemite Valley. This beneficial impact would be partially offset by adverse impacts associated with limitations on certain activities, such as placement of non-motorized watercraft launch facilities.

The effects of Alternative 5 zoning on camping or lodging in Yosemite Valley are analyzed in this section under the heading “Visitor Services.”

Impacts in the Merced River Gorge and El Portal. In the gorge segment, recreational access and availability within the corridor would not change significantly from existing conditions under this alternative.

In El Portal, swimming occurs at Patty’s Hole and near the sand pit. Fishermen access the river from the sand pit, as well as between Patty’s Hole and the sand pit. Management zoning (mainly zone 2C) under Alternative 5 would not alter access to the river nor preclude any of these recreational activities in El Portal. In fact, zoning prescriptions for undeveloped lands in El Portal could allow for greater recreational use. At the Trailer Village, for example, new 3C zoning (Park Operations) would allow for construction of community ballfields and swingsets and would allow for an increase in usage of the El Portal area. Opportunities for greater recreational use due to 2C zoning in El Portal and 3C zoning at the Trailer Village would constitute a long-term, minor, beneficial impact on recreation.

Outstandingly Remarkable Values within the gorge and El Portal include a range of river-related recreational opportunities, in particular white-water rafting and kayaking (class III to V), fishing, picnicking, photography, and sightseeing. Effects on recreation-related Outstandingly Remarkable Values within these segments of the Merced River are considered beneficial under this alternative.

Impacts in Wawona. Application of 2B, 2C, and 2D management zoning under Alternative 5 would allow many recreational opportunities similar to existing use patterns, but would alter some uses. The trail system would remain unaffected by zoning but could require adjustment over time as a result of VERP monitoring and implementation of VERP management actions. Application of the 2C and 2D management zones would allow more active, intensive recreational activities. Opportunities for solitude and quiet recreation would be allowed in the 1A and 2B zones. As a result, management zoning in Wawona would provide areas for more active, intensive recreation as well as areas with opportunities for solitude and quiet recreation. Management zoning in Wawona would have a long-term, negligible, beneficial impact associated with providing a spectrum of recreational opportunities.

Outstandingly Remarkable Values within Wawona include opportunities to experience a spectrum of river-related recreational activities, from nature study and photography to hiking. Effects to recreation-related Outstandingly Remarkable Values within Wawona of the South Fork of the Merced River are considered beneficial under this alternative.

The effects of Alternative 5 zoning on camping or lodging in Yosemite Valley are analyzed in this section under the heading “Visitor Services.”

Summary of Alternative 5 Impacts. Alternative 5 could have a local, long-term, minor, beneficial impact on visitor experience as it relates to access to and availability of recreational opportunities, because of potential increased availability and continued accessibility of recreational opportunities in the river corridor.

Cumulative Impacts

Cumulative impacts on visitor experience as it relates to recreation are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified include only those that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions would have a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities (e.g., restrooms) that mitigate adverse effects associated with visitor use.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on visitor experience. Short-term construction-related effects include travel delay and closure of the area to recreational use. Those effects are mitigated by implementation of a traffic control plan with measures such as strict construction timing restrictions, roadway safety procedures, and the use of flaggers, and signals. Long-term effects are improved access to recreational opportunities along the river corridor and El Portal Road, and easier, more dependable, and safer access for recreational vehicles, buses, and other vehicles to Yosemite Valley and other park destinations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both adverse and beneficial effects; and (3) projects anticipated to have a net adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to recreation include:

- The Yosemite Area Regional Transportation System (YARTS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)
- The Merced River Canyon Trail Acquisition (BLM)

These projects would provide increased access for visitors to the park and expand recreational opportunities in the vicinity of the park.

Reasonably foreseeable projects that could have both adverse and beneficial impacts include:

- The *Yosemite Valley Plan* (NPS)
- The update to the *Yosemite Wilderness Management Plan* (NPS)

These projects have the potential to enhance the quality of the visitor experience in the wilderness and Yosemite Valley but also could result in the removal of existing recreational facilities. For example, the *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could be considered a local, long-term, adverse impact to some users, due to the loss of a unique lodging experience in the wilderness. This action could also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness, a reduction in stock impacts, improvements in scenic and natural quiet, and improvements in opportunities for solitude and a primitive and unconfined recreational experience.

Reasonably foreseeable projects that could have a net adverse effect on visitor experience include:

- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); Hazel Green Ranch (Mariposa Co.); and the Yosemite West Rezoning Application (NPS)

These projects could increase visitor use in the park and in the river corridor and could contribute to increased congestion and reduce the quality of specific, solitude-based recreational opportunities in the park.

The cumulative projects would have a long-term, negligible, beneficial impact, because the beneficial impacts associated with increased visitor access and expanded recreational opportunities would be partially offset by the adverse impacts associated with the removal of specific recreational opportunities.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a local, long-term, minor, beneficial impact on visitor experience as it relates to access to and availability of recreational opportunities. This impact would be beneficial because of potential increased availability and continued accessibility of recreational opportunities in the river corridor, an increase in visitor access, an expansion of recreational opportunities, and improved quality of the natural environment. This beneficial impact would only be partially offset by the removal of specific recreational opportunities.

Conclusions

Alternative 5 could have a local, long-term, minor, beneficial impact on visitor experience as it relates to access to and availability of recreational opportunities, because of potential increased availability and continued accessibility of recreational opportunities in the river corridor.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a local, long-term, minor, beneficial impact on visitor experience as it relates to access to and availability of recreational opportunities. This impact would be beneficial because of potential increased availability and continued accessibility of recreational opportunities in the river corridor, an increase in visitor access, an expansion of recreational opportunities, and improved quality of the natural environment. This beneficial impact would only be partially offset by the removal of specific recreational opportunities.

Interpretation & Orientation

Analysis

The following discussion provides an overview of the types of impacts to interpretation and orientation that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of the wilderness portions of the Merced River corridor is not anticipated to alter interpretation or orientation of these areas compared to the No Action Alternative. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue as currently managed. There would be no impact compared to Alternative 1.

Impacts in Yosemite Valley. Under Alternative 5, the availability and diversity of interpretation, orientation, education, and information services within the corridor, and the size of the groups these programs serve, could change. The ability to provide a full range of interpretive programs and services in the Merced River corridor could be limited in some areas as a result of management zoning prescriptions that would direct visitor access to particular areas along the river and away from other areas. For example, certain management zoning prescriptions (zone 2B) in west Yosemite Valley would allow mainly for self-guided interpretation and ranger-led programs limited to small groups. Other management zoning (zone 2C) in Yosemite Valley

would allow for a full range of interpretive programs and exhibits. Amphitheater programs could continue at Lower Pines Campground under this alternative.

Management zoning in the corridor would allow for placement of a transit center and/or day-visitor parking facility in Yosemite Valley, either at Taft Toe or at Camp 6 (zone 3C). If a visitor center were included in this facility, visitors arriving by private vehicle or transit bus would have easy access to orientation and interpretive programs and services, a local, long-term, negligible, beneficial impact.

Interpretive programs and services offered by the park partners and the concessioner could essentially continue as presently managed throughout Yosemite Valley.

Impacts in the Merced River Gorge and El Portal. There are no interpretive programs currently offered in the gorge or El Portal. Under Alternative 5, this condition would not change (compared to Alternative 1). The application of management zoning proposed under Alternative 5 would not affect existing interpretive signs and exhibits. There would be no impact compared to Alternative 1.

Impacts in Wawona. The application of management zoning in Wawona is not anticipated to alter interpretation or orientation of these areas compared to Alternative 1. Under Alternative 5, the Pioneer Yosemite History Center in Wawona would continue as currently managed and would not be relocated out of the corridor. Amphitheater programs could continue at Wawona Campground. Interpretive programs and services offered by the park partners and the primary concessioner would continue as currently managed throughout the Merced River corridor. There would be no impact compared to Alternative 1.

Summary of Alternative 5 Impacts. Alternative 5 could have a local, long-term, negligible, beneficial impact on visitor experience because access to interpretation and orientation programs and services could be expanded, particularly with a possible new visitor center in Yosemite Valley. This beneficial impact would only be partially offset by programs and services being somewhat more limited and directed to particular areas pursuant to Alternative 5.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to orientation and are based on analysis of past and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect visitor interpretation and orientation within the river corridor or in the park vicinity.

Past Actions. In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under the jurisdiction of these agencies. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to

withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to orientation and interpretation include:

- The *Yosemite Valley Plan* (NPS)
- South Entrance/Mariposa Grove Site Planning (NPS)

These projects could enhance the quality of the visitor experience by expanding interpretation and orientation services in Yosemite Valley and Wawona.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

This planning effort could prescribe the closure of the Merced Lake High Sierra Camp. The potential discontinuation of visitor use of the Merced Lake High Sierra Camp would disrupt the High Sierra Camp loop-trip experience and the ranger-led interpretive hikes in the wilderness. On the other hand, this could result in a beneficial effect for other user groups who would benefit from a reduction in facilities in the wilderness and enhanced opportunities for solitude and self-guided interpretive experiences.

The cumulative projects would have a long-term, minor, beneficial impact, because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by the potential loss of ranger-led hikes in the wilderness.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact on interpretation and orientation, because the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by some programs and services being more limited and directed to particular areas pursuant to Alternative 5 and by the potential loss of ranger-led hikes in the wilderness.

Conclusions

Alternative 5 could have a local, long-term, negligible, beneficial impact on visitor experience because access to interpretation and orientation programs and services could be expanded, particularly with a possible new visitor center in Yosemite Valley. This beneficial impact would only be partially offset by programs and services being somewhat more limited and directed to particular areas pursuant to Alternative 5.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact on interpretation and orientation, because

the beneficial impacts associated with an increase in interpretation and orientation programs and services would only be partially offset by some programs and services being more limited and directed to particular areas pursuant to Alternative 5 and by the potential loss of ranger-led hikes in the wilderness.

Visitor Services

Analysis

The following discussion provides an overview of the types of impacts to visitor services that could occur within each segment of the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning).

Impacts in Wilderness. The proposed management zoning (zones 1A, 1B, 1C, and 1D) of wilderness portions of the Merced River corridor is not anticipated to alter visitor services within these areas compared to the No Action Alternative. Access to an organized camping experience in the wilderness at the backpackers campgrounds (Little Yosemite Valley, Moraine Dome, and Merced Lake Backpackers Campgrounds) would not change under this alternative. In addition, visitors could still establish independent camps in the wilderness under the wilderness permit and quota systems and the *Wilderness Management Plan*. Interpretive programs in the wilderness, such as ranger talks at Little Yosemite Valley Backpackers Campground and ranger-led loop hikes in the wilderness that visit the High Sierra Camps, including Merced Lake High Sierra Camp, would continue.

Impacts in Yosemite Valley. Under Alternative 5, the availability and diversity of visitor services could change from what is currently available in Yosemite Valley. The demand for visitor services, including camping and lodging, is currently unmet in the summer months, though existing food and retail services are able to meet visitor demand.

During the peak summer months, Camp 4 (Sunnyside Campground), North Pines Campground, Upper and Lower Pines Campgrounds, and Curry Village are typically full. In addition, Housekeeping Camp is typically full in the peak months, and Yosemite Lodge is at capacity year-round.

Under Alternative 5, many of the campgrounds in the floodplain could be maintained or expanded beyond what was in place prior to the 1997 flood. For example, campsites that were closed as a result of flood damage (i.e., Upper and Lower River Campgrounds) could be reopened. In addition, North Pines and Upper Pines Campgrounds could function as full-service drive-to campgrounds, and Yellow Pine Campground (currently set aside for park volunteers) could be used for visitor camping. Units removed from Yosemite Lodge due to flood damage could be replaced in adjacent locations under this alternative, which could substantially increase the total number of lodge units.

This alternative would improve the ability of the park to meet visitor demand for camping and lodging accommodations during the peak summer months in Yosemite Valley. Visitors would still need to plan ahead to secure overnight accommodations during the peak times, but more

visitors could be accommodated. The potential for parkwide changes in camping and lodging under Alternative 5 could result in a local, long-term, moderate, beneficial impact.

The National Park Service, park partners, and the primary park concessioner would continue to operate food service and retail outlets in the Valley and thus would continue to meet demand. Therefore, no impacts associated with these aspects of visitor experience would occur.

Impacts in the Merced River Gorge and El Portal. There are no visitor services currently offered in the gorge; those services available in El Portal are mostly run by private businesses (e.g., lodging, restaurants, etc.) and would not be affected by Alternative 5.

Impacts in Wawona. During peak summer months, Wawona Campground and the Wawona Hotel are typically full. In Wawona, recreational access and availability within the corridor would not change significantly from existing conditions, except that an area in Section 35, zoned 3A/3C, would be available for additional camping as prescribed in the *General Management Plan*. Should a new campground be developed in Section 35, this could result in a local, long-term, minor, beneficial impact to visitor services due to the improved ability of the park to meet visitor demand for camping.

Summary of Alternative 5 Impacts. Various changes to access and availability of camping and lodging accommodations under Alternative 5 could result in a local, long-term, moderate, beneficial impact on visitor experience as it relates to visitor services, because of the possible increase in camping and lodging accommodations in the Valley and in Wawona.

Cumulative Impacts

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect visitor experience within the river corridor or in the park vicinity.

Past Actions. Upper and Lower River Campgrounds and part of Lower Pines Campground were closed following damage sustained during the 1997 flood. This resulted in a decrease in the overall number of campsites available to visitors in the Valley. Similarly, lodging units at the Yosemite Lodge were removed as a result of flood damage and have not been replaced.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Examples of projects that could have a cumulative, beneficial effect on visitor services include:

- The Yosemite Area Regional Transportation System (YARTS)
- Several Yosemite campground rehabilitation projects, such as at Bridalveil Horse Camp, Yosemite Creek Campground, Tamarack Campground, Wawona Campground, and Hodgdon Meadow Campground (NPS)

- Several development-related projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Garrotte Restaurant, Second Garrotte Basin (Tuolumne Co.); the Rio Mesa Area Plan (Madera Co.); and the Yosemite West Rezoning Application (NPS)

These projects could improve transportation to and from the park, which would ultimately have a beneficial effect on visitor services by providing increased access for visitors staying outside the park. In addition, the number of campsites and lodging units in the park and in the park vicinity could increase, which would improve visitor services for park visitors.

Reasonably foreseeable projects that could have a net adverse effect on visitor services include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. This change could affect the ability to meet the lodging demand in the corridor and park and could be considered an adverse impact, due to the loss of a unique lodging experience in the wilderness.

Examples of projects that could have a cumulative mixed effect on visitor services include:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* proposes restoration of degraded areas and a reduction of development within the Merced River ecosystem while enhancing the quality of the visitor experience in Yosemite Valley. Visitor services could be improved by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. The *Yosemite Valley Plan*, however, would prescribe a reduction in camping and lodging units in Yosemite Valley, which would have an adverse effect on the provision of visitor services.

These cumulative projects would have a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park. The potential for overnight accommodation facilities to be increased in the Valley, as described in Alternative 5, would be clarified by the specific actions proposed in the *Yosemite Valley Plan*.

Conclusions

Various changes to access and availability of camping and lodging accommodations under Alternative 5 could result in a local, long-term, moderate, beneficial impact on visitor experience as it relates to visitor services, because of the possible increase in camping and lodging accommodations in the Valley and in Wawona.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on visitor services due to the reduction of camping and lodging opportunities in Yosemite Valley and potential closure of the High Sierra Camps. These adverse impacts would be partially offset by improving transportation to and from the park, rehabilitating and expanding some campgrounds in the park, and expanding lodging opportunities outside the park. The potential for overnight accommodation facilities to be increased in the Valley, as described in Alternative 5, would be clarified by the specific actions proposed in the *Yosemite Valley Plan*.

Wilderness Experience

Analysis

The following discussion provides an overview of the types of impacts to the wilderness experience that could occur within the Merced River corridor from application of management elements (e.g., the VERP framework, management zoning).

Under Alternative 5, management zone prescriptions applied to wilderness areas within the Merced River corridor reflect existing conditions. The wilderness zones include trailed areas with heavy use, trailed areas with light use, and untrailed areas. Most visitors experience the wilderness area by foot, though there is a small percentage of stock use. Heavy Use Trails (zone 1C), particularly en route to the wilderness via Little Yosemite Valley, provide the least opportunity for solitude, as encounters with other visitors are likely to be frequent. In the Trailed Travel zones (1B), visitor encounters would be infrequent, except at key trail junctions and camping areas (e.g., near Merced Lake High Sierra Camp). In the Untrailed zones (1A), there would be a very high potential for solitude and primitive camping experiences due to the remoteness of the area.

Management zoning prescriptions under this alternative would not change access to the wilderness or access to backpackers campgrounds in the wilderness.

Overall, access to the wilderness within the Merced River corridor would continue to be managed under the current wilderness permit system, and primitive camping and opportunities for solitude would remain available. At present, the park is able to accommodate visitor requests for wilderness permits parkwide, although demand specifically for access to the upper reaches of the Merced River corridor (particularly in Little Yosemite Valley) exceeds the availability of wilderness permits as controlled by the quota system. This condition would likely continue under Alternative 5 in order to maintain the management direction that visitors have the ability to experience solitude and engage in a primitive camping experience in the wilderness.

Summary of Alternative 5 Impacts. The wilderness experience under Alternative 5 would be the same as that for Alternative 1. Therefore, this is considered to have no impact under Alternative 5.

Cumulative Impacts

Cumulative effects on the wilderness experience are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect the wilderness experience within the river corridor or in the park vicinity.

Past Actions. The wilderness permit/trailhead quota system, established in 1974-1976 set limits for the numbers of people allowed to enter the wilderness per day per trailhead. These limits were based on extensive research and monitoring to assess capacity based on ecological and social considerations, and were in response to exceptionally high levels of use in the early- to mid-1970s. This system has had beneficial impacts on the wilderness experience through implementation of a quota system to protect natural resources.

Present Actions. The wilderness permit/trailhead quota system continues to limit and/or disperse use based on trailhead access, and thus provides the beneficial impact of improved experience of natural values due to resource protection.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have both a beneficial and adverse effect.

Examples of projects that could have a cumulative, beneficial effect on regional visitor experience as it relates to wilderness experience include:

- Several planning or restoration efforts are in various stages of development, including the *Fire Management Plan* (NPS); the *Fire Management Action Plan for Wilderness* (USFS); the *Sierra Nevada Framework for Conservation and Collaboration* (USFS); *Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch Wildernesses* (USFS); the *Pinecrest Basin Forest Plan Amendment* (USFS, Stanislaus); the *Tuolumne Meadows Development Concept Plan* (NPS); and *Tuolumne Wild and Scenic River Management Plan* (NPS)
- The *Merced Canyon River Trail Acquisition* (BLM)

These projects could result in the restoration of wilderness areas within the park and in the park vicinity. Any improvement to the wilderness ecosystem is considered to be a long-term, beneficial impact.

Reasonably foreseeable projects that could have both a beneficial and adverse effect include:

- The update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Wilderness Management Plan* could prescribe the closure of the High Sierra Camps. The structures would remain to be interpreted as cultural resources. This change could affect the ability to meet lodging demand and would impact some users due to the loss of a unique lodging experience in the wilderness. In addition, the potential discontinuation of visitor

use of the High Sierra Camps would eliminate the High Sierra Camp loop-trip experience. On the other hand, this action might also result in a beneficial effect for other user groups whose access to the wilderness would not be affected, but who would benefit from a reduction in facilities in the wilderness and a reduction in stock impacts. These individuals could benefit from improvements in scenic and natural quiet qualities, opportunities for solitude, and an overall primitive recreational experience.

These cumulative projects would have a long-term, minor, beneficial impact on the wilderness experience, because the wilderness ecosystem would be improved and would only be partially offset by the long-term, adverse impact of removing the High Sierra Camps.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Conclusions

The wilderness experience under Alternative 5 would be the same as that for Alternative 1. Therefore, this is considered to have not impact under Alternative 5.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, beneficial impact to the wilderness experience, because the beneficial improvements to the wilderness ecosystem would offset the adverse impacts associated with the removal of the High Sierra Camps.

Social Resources

Land Use

Analysis

General Impacts. Under the management zones for Alternative 5, expansion and/or development of uses and facilities within the river corridor could occur, altering the intensity of the use of a specific site. However, the basic land use designation of Yosemite National Park (i.e., public parklands) would not change under Alternative 5, and National Park Service policy concerning the acquisition of private lands within or adjacent to the park is compatible with current plans and policies and would not change under Alternative 5; therefore, there would be no land-use impacts on parklands or other properties within or adjacent to the park.

Private property within the river corridor in El Portal and Wawona, and is not zoned under the *Merced River Plan*. Management zones in the *Merced River Plan* would not result in land use conflicts with existing land uses and existing plans and policies and would not induce changes in those land uses.

Section 8 of the Wild and Scenic Rivers Act withdraws lands within the boundaries of Wild and Scenic Rivers from “public entry, sale, or disposition under the public land laws of the United

States.” This section of the Wild and Scenic Rivers Act preempts public land laws, such as the 1872 General Mining Act under which nonreserved public lands may be disposed of for private use. However, because Yosemite National Park is by definition “reserved land,” this provision is largely irrelevant to the *Merced River Plan*. Furthermore, much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772).

In accordance with Section 9 of the Wild and Scenic Rivers Act, lands within one-quarter mile of the main stem and South Fork of the Merced River have been withdrawn from all forms of appropriation under mining and mineral leasing laws of the United States. Because much of the river corridor had previously been withdrawn after the creation of Yosemite National Park and the establishment of the El Portal Administrative Site (72 Stat. 1772), no additional lands have been identified for withdrawal under the *Merced River Plan*.

Summary of Alternative 5 Impacts. Under Alternative 5, the adoption of management zoning is considered to be a short-term, minor, beneficial impact. Since the basic land use of the park would not change, no impacts to land uses would occur as a result of Alternative 5.

Cumulative Impacts

Cumulative impacts to land use discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect land use within the river corridor and in the immediate vicinity of Yosemite National Park.

Past Actions. In general, land uses in the Merced River corridor have been determined by past decisions on the development, relocation, and removal of specific facilities. Development within the Merced River corridor has occurred since Euro-American occupation.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Present Actions. The El Portal Road Reconstruction Project does not affect the land uses within the Merced River corridor.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that are anticipated to change overall land uses can be separated into local and regional projects. Local projects (i.e., those within the park and involving parklands) being carried out under the direction of the National Park Service include:

- The *Yosemite Valley Plan*, the Yosemite View parcel land exchange, El Portal; South Entrance/Mariposa Grove Site Planning; Resources Management Building; Yosemite West Rezoning Application; Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan; Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and Crane Flat Campus Redevelopment (NPS, YNI)
- Several Yosemite campground rehabilitation projects include Tamarack Campground, Bridalveil Horse Camp, Yosemite Creek Campground, Hodgdon Meadow Campground, and the Wawona Campground Improvement (NPS)

Local projects have the potential to change land uses within the park. For example, the *Yosemite Valley Plan* could change existing land uses and the intensity of existing land uses within portions of the Merced River corridor in Yosemite Valley as well as in El Portal and Wawona. These changes to land uses would be dictated by the development plans outlined in the *Yosemite Valley Plan*.

Another example of a local project is the land exchange between the National Park Service and the owner of a parcel of private property near the park's western entrance at the El Portal Administrative Site. The owner of the private parcel would receive a plot of National Park Service land adjacent to the owner's hotel properties in exchange for the landowner's plot two miles west of the Arch Rock Entrance Station. This land exchange would allow the National Park Service to construct facilities, such as a vehicle turnaround area, that would increase the vehicle handling efficiency of the entrance station. The U.S. Congress has passed legislation allowing this land exchange to occur, but it is not yet completed. Though completion of the land exchange would alter the land use for those two plots of land, the overall effect would be negligible, because the two plots of land are close together and there would be no net change in the amount of each type of land use in the area. A similar land exchange would also take place in Wawona. The Seventh Day Adventist recreational camp is located in Wawona on privately owned land inside the boundaries of Yosemite National Park. The privately owned land occupied by the camp literally abuts portions of Yosemite's designated Wilderness. To protect designated Wilderness, this project would exchange lands between the National Park Service and the Seventh Day Adventist camp.

Regional projects (those that take place outside of the Park) that would affect land use and planning within the Yosemite region and are not under National Park Service jurisdiction include:

- Projects undertaken by county governments include: Hazel Green Ranch (Mariposa Co.); Mariposa County General Plan Update (Mariposa Co.); Yosemite Motels, El Portal (Mariposa Co.); Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); Buildout of the City of Merced, General Plan (City of Merced); Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); and Evergreen Road Improvements (multi-agency, see Appendix G)
- Projects undertaken by federal agencies include: *South Fork and Merced Wild and Scenic River Implementation Plan* (USFS, BLM); *Sierra Nevada Framework for Conservation and Collaboration* (USFS); and *Merced River Canyon Trail Acquisition* (BLM)

Regional projects have the ability to alter land use in the park vicinity. An example of such a project would be the Mariposa County General Plan Update, which is scheduled to begin in 2000. Although the plan does not explicitly call for land use changes, it does provide general guidance for land use, zoning, and development throughout Mariposa County, which could likely impact land use in the long term.

Another regional project that could affect land use is the *South Fork and Merced Wild and Scenic River Implementation Plan*. This plan covers management of lands along river segments including: a 15-mile portion of the main stem extending from the El Portal Administrative Site to a point 300 feet upstream of the confluence with Bear Creek; a 21-mile segment of the South Fork from the park boundary to the confluence of the Merced River; and a 3-mile segment of the South Fork just upstream of Wawona, where the National Park Service has jurisdiction over the north side of the river and the U.S. Forest Service has jurisdiction over the south side. The plan calls for the long-term protection of natural and cultural resources, and managing the area for the use and enjoyment of visitors in a way that will leave the resource unimpaired for future use and enjoyment as a natural setting.

The impact intensity of planning projects would depend upon the extent to which the plan's recommendations were implemented. Land uses would most likely shift in various areas. The short-term impacts on land use would be neither adverse nor beneficial; likewise, long-term impacts on land use would be neither an adverse nor beneficial.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Conclusions

Since the basic land use designation would not change, no impacts to land uses would occur as a result of Alternative 5.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in no net effect on land use (i.e., the impact would be neither beneficial nor adverse), due to the fact that land uses would simply shift.

Transportation

Analysis

General Impacts. The following discussion provides an overview of the types of transportation impacts that could occur within the Merced River corridor from application of Alternative 5.

Under Alternative 5, there is a potential that the number of overnight accommodation facilities in the park (campsites or lodging) could be increased from that under Alternative 1, which would shift the mix of park overnight visitors and day visitors (i.e., more visitors would be able to stay

overnight in the park).³ If the number of park overnighers increased, then less regional traffic (entering and leaving the park) would be generated, because the additional overnighers would not need to make two trips per day between their out-of-park accommodations and attractions within the park. This would have a long-term, minor, beneficial impact on traffic conditions at park entrances and on the majority of park roadways (i.e., outside of Yosemite Valley, including in Wawona and El Portal) by slightly decreasing delays experienced by queues of backed-up vehicles, and slightly decreasing congestion and delays experienced by drivers on roadways outside of the Valley.

The effect on local traffic conditions within Yosemite Valley would depend on whether a transit center and/or day-visitor parking facility were developed at either Taft Toe or Camp 6 as a result of the 3C zone. If a transit center and/or day-visitor parking facility were developed, then local traffic congestion in the east Valley would be reduced. Day visitors (i.e., those visitors without reservations for overnight accommodations in Yosemite Valley) would be intercepted at a traffic check station on Southside Drive in the El Capitan crossover and would be directed to the transit center and/or parking facility (at either Taft Toe or Camp 6). Day visitors then would move between destinations in the Valley by shuttle bus, bicycle, or on foot. The number of private vehicles entering the more-congested east Valley would be reduced, with a greater degree of reduction if a transit center and parking facility were established at Taft Toe than if it were established at Camp 6, because day-visitor vehicles intercepted at the traffic check station could be used in a larger area of the Valley before reaching the latter location. A transit center and/or parking facility would shift visitors (local overnighers and day visitors) from their private vehicles to Valley shuttle buses, which would have a long-term, minor, beneficial impact (if at Camp 6) or long-term, moderate, beneficial impact (if at Taft Toe) on traffic conditions in the east Valley by slightly (or moderately) reducing congestion and delays experienced by drivers.

The 2B zone under Alternative 5 could allow for the removal of parking spaces from the Merced River corridor. If those spaces were removed and not relocated elsewhere, then more traffic congestion would be generated within the park, because visitors unable to find an authorized place to park would circle around, increasing traffic volumes at congested locations. This would have a long-term, negligible, adverse impact on traffic conditions in Yosemite Valley by negligibly increasing congestion and delays experienced by drivers. If parking spaces inconsistent with Alternative 5 zoning were relocated to areas in the river corridor with zoning designations consistent with parking (e.g., a transit center and/or day-visitor parking facility at Taft Toe or Camp 6 in Yosemite Valley), the relocated spaces would reduce the above-described adverse effects of removing parking spaces within the river corridor. In addition, if a transit center and/or parking facility were not built at either Taft Toe or Camp 6, parking spaces removed from within the river corridor could be relocated to outside the corridor (e.g., near Yosemite Village), which also would reduce the adverse effects of removing parking from within the river corridor. It also is assumed that the Restricted Access Plan would continue to be implemented during peak-season periods when criteria for implementation were met.

³ Within the potential overall increase in the number of overnight accommodation facilities in the park is the potential removal of some of the campsites at the Wawona Campground, or the possible relocation of those campsites to other areas in the park, such as Section 35 in Wawona.

Additionally, if parking spaces inconsistent with the 2A and 2B zones under Alternative 5 were removed and not relocated elsewhere (as described above), then conflicts between vehicles would potentially increase, because visitors unable to find an authorized space could decide to park in unauthorized/improper areas. This would have a long-term, negligible, adverse impact on traffic safety conditions by negligibly increasing the potential for traffic safety hazards.

Summary of Alternative 5 Impacts. The implementation of potential future actions in accordance with the management zoning of Alternative 5 is considered to be a long-term, negligible, beneficial impact, because the minor, beneficial impacts associated with an increase in overnight accommodations and the potential development of a transit center and/or day-visitor parking facility would be partially offset by the potential removal of parking spaces within the river corridor.

Cumulative Impacts

Cumulative transportation effects discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect access and transportation in the vicinity of the river corridor.

Past Actions. Development of a circulation system that includes roadways, parking areas, and bridges has occurred within and in the vicinity of Yosemite National Park. This circulation system was developed to provide access to the park and the surrounding areas. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley are overcongested. The plan has the effect of reducing the number of incoming vehicles until the traffic volume and parking demand in the Valley decreases sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions.

Present Actions. The El Portal Road Reconstruction Project (NPS) is currently underway and has both adverse (short-term during construction) and beneficial (long-term) effects on transportation. Short-term, construction-related effects include visitor delays and visitor hazards through the construction work zone. Those effects are mitigated by implementation of a traffic control plan, with measures such as strict construction timing restrictions, roadway safety procedures, flaggers, and signalling. Current safety improvements on Segments A, B, and C of El Portal Road would facilitate regional transit service on that route, which would be a long-term, beneficial impact.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have adverse effects.

Reasonably foreseeable projects that could have a cumulative, long-term, beneficial effect on regional transportation include the following:

- The Yosemite Area Regional Transportation System (YARTS)
- San Joaquin Corridor Rail Projects (DOT, Amtrak)
- The Yosemite West Rezoning Application (NPS)
- The *Yosemite Valley Plan* (NPS)

The aforementioned projects, individually and in combination, would reduce congestion by encouraging travel to the park by alternative (non-private vehicle) modes. For example, YARTS is a collaborative, multi-agency effort to evaluate the feasibility of a regional transportation system and to determine the organizational structure of an entity that would implement and operate the system. The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also could provide a means for visitors to travel to Yosemite Valley when the Restricted Access Plan is implemented for private vehicles during times of severe congestion. The initial YARTS service would be a demonstration project (scheduled to begin by early summer 2000), with a target market of visitors staying overnight in the gateway communities and employees working at Yosemite National Park who live in the gateway communities. A successful YARTS would reduce the number of day visitors arriving in private vehicles. Similarly, the Yosemite West Rezoning Application would include a provision for a regional staging area to provide visitor parking and linkage to regional public transportation systems. The preferred alternative of the *Yosemite Valley Plan* would consolidate parking for day visitors at Yosemite Village and in parking areas outside Yosemite Valley (at Badger Pass, El Portal, and South Landing), which would result in a reduction in vehicle travel in the eastern portion of Yosemite Valley. The circulation pattern in Yosemite Valley would be changed by the removal of roads from Ahwahnee and Stoneman Meadows, the removal of parking from Curry Orchard, the conversion of Northside Drive to a multi-use (bicycle and pedestrian) paved trail from El Capitan crossover to Yosemite Lodge, and the conversion of Southside Drive to two-way traffic between El Capitan crossover and Curry Village. The implementation of these projects would result in a reduction in automobile congestion within Yosemite Valley. In addition, parking lots(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses.

Reasonably foreseeable projects that could have a short-term, adverse effect but a cumulative, long-term, beneficial effect on regional transportation include:

- Highway 41 Extension (Madera Co.)
- South Entrance/Mariposa Grove Site Planning (NPS)
- Yosemite Valley Shuttle Bus Stop Improvements (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- Road Realignment and Bridge Replacement of Highway 49 and Old Highway (Mariposa Co.)
- Mariposa Creek Pedestrian/Bike Path (Mariposa Co.)
- Evergreen Road Improvements (multi-agency, see Appendix G)

Although the above projects would have site-specific and short-term, adverse effects (e.g., construction-related transportation effects), the general goal of these projects is to improve regional transportation circulation and safety.

Reasonably foreseeable projects that could have a short-term adverse effect on regional transportation include:

- Several water improvement projects, such as the Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, Hodgdon Meadow Water and Wastewater Treatment Improvements, and Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS); Cherry Dam Fuse Gate, O'Shaughnessy Dam Well, and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- Forest-related projects, such as the Orange Crush Fuels Treatment Projects and the A-Rock Reforestation (USFS, Stanislaus); and the Rogge-Ackerson Fire Reforestation (Tuolumne Co.)
- Various development-related projects, such as the Yosemite View parcel land exchange, El Portal (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; Double Eagle Resort, June Lake (Mono Co.); Tioga Inn, Lee Vining (Mono Co.); June Lake Highlands (Mono Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hardin Flat Lodging and Conference Facility (Tuolumne Co.); Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.); Crane Flat Campus Redevelopment (NPS, YNI); Wilderness Boundary Protection Land Exchange, Seventh Day Adventist Camp, Wawona (NPS); and the Resources Management Building (NPS)

The adverse effects associated with the above projects would be short term in nature, primarily related to construction-generated traffic on roadways serving the project sites. These projects would not result in any net long-term effects to regional transportation.

Given the potential for a reduction in the number of day visitors arriving in private vehicles, these cumulative projects would have a long-term, minor to moderate, beneficial impact on the regional transportation system. The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented. The short-term construction-related traffic impacts that would occur from development of site-specific projects would not appreciably alter these long-term, beneficial impacts.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to moderate, beneficial impact on traffic and traffic safety conditions in Yosemite National Park, because these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would manage traffic and parking to reduce congestion. The intensity of the impact depends on the implementation of various projects that would benefit the transportation system.

Conclusions

The implementation of potential future actions in accordance with the management zoning of Alternative 5 is considered to be a long-term, negligible, beneficial impact, because the minor, beneficial impacts associated with an increase in overnight accommodations and the potential development of a transit center and/or day-visitor parking facility would be partially offset by the potential removal of parking spaces within the river corridor.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor to moderate, beneficial impact on traffic and traffic safety conditions in Yosemite National Park, because these projects would, individually and in combination, encourage travel to the park by alternative (non-private vehicle) modes and would manage traffic and parking to reduce congestion. The intensity of the impact depends on the implementation of various projects that would benefit the transportation system.

Scenic Resources

Analysis

General Impacts. Scenic Outstandingly Remarkable Values listed in the 1996 *Draft Yosemite Valley Housing Plan* have been revised based on the application of new scientific information and to accurately reflect Outstandingly Remarkable Value criteria included in the Interagency Coordinating Council guidelines for implementation of the Wild and Scenic Rivers Act. Specifically, those resources that are not related to the Merced River or not unique to the region or nation have been removed (e.g., the confluence of tributaries in Wawona, magnificent views of Triple Divide Peak and the Sierra Crest within the wilderness segment of the South Fork). Removal of these resources from the list of Outstandingly Remarkable Values would not alter their management or protection. These resources would continue to be managed and protected by existing park policy and guidelines (e.g., *General Management Plan* and *Resources Management Plan*), as well as by federal law (e.g., the 1916 Organic Act). Scenic Outstandingly Remarkable Values common to the entire Merced River (main stem and South Fork) are now focussed on spectacular views from the river and its banks. The revised Outstandingly Remarkable Values provide greater focus on the Merced River than those presented in the 1996 *Draft Yosemite Valley Housing Plan*.

Implementation of the Visitor Experience and Resource Protection (VERP) framework would have a local, long-term, minor, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values of the main stem and South Fork of the Merced River. VERP is intended to institutionalize an ongoing adaptive management program in which park staff would continuously monitor visitors and resources, identify discrepancies between existing and desired visitor experiences and resource conditions, and take action to achieve desired conditions. If monitoring determined that desired visitor experiences and resource conditions were not being met in a particular management zone, management sub-zone, or segment, then management actions could be undertaken. An example of a management action that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leafed trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This would likely open previously closed views and improve the texture and lighting of the foreground of any landscape viewable from the Merced River corridor.

The following discussion provides an overview of the types of impacts to scenic resources that could occur within each segment of the Merced River corridor from application of management elements (e.g., management zoning, the VERP framework).

Impacts in the Wilderness. Scenic Outstandingly Remarkable Values of the wilderness include views from the Merced River and its banks of the exposed bedrock riverbed, Merced Lake and Washburn Lake, the Bunnell Cascades, the confluence of tributaries, a large concentration of granite domes, and the Clark and Cathedral Ranges. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (as prescribed by zones 1A, 1B, 1C, and 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. Although the proposed zoning is not anticipated to alter use patterns or existing facilities within the wilderness reaches of the Merced River, these management elements would limit the type of new facilities (e.g., campsites with facilities are prohibited in the 1B zone) that possibly could be built in the Merced River corridor. This would limit potential adverse effects on scenic resources associated with disruption of native vegetation or placement of facilities in undeveloped areas. The application of management zoning within wilderness segments would have a local, long-term, negligible, beneficial effect on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in Yosemite Valley. Under Alternative 5, the total number of overnight accommodations in Yosemite Valley (campsites and structured lodging, zones 3A and 3B) could be increased, as compared to the No Action Alternative. Substantial areas in east Yosemite Valley would be zoned 3A and 3B, which would allow for the potential development of camping and lodging in areas that do not currently have these uses. For example, lodging at Yosemite Lodge and Curry Village could be expanded, and camping would be permitted in 3A zones that cover large tracts of east Yosemite Valley, including Upper and Lower River Campgrounds.

Increasing the total number of overnight accommodations in Yosemite Valley would likely have a local, long-term, moderate, adverse effect on scenic resources in east Yosemite Valley due to an increase in the amount of developed area in the corridor, and a decrease in the amount of naturally vegetated areas in the Valley.

Alternative 5 also would allow for the creation of a transit center and/or day-visitor parking facility at Taft Toe or Camp 6 (zone 3C) in Yosemite Valley. The development at either Taft Toe or Camp 6 would have an adverse effect on scenic resources in the Valley due to the intrusion of the new structures into the visual landscape, including the introduction of new transportation-related facilities and the reflective glare and visual intrusion of parked vehicles at these locations. The extent of the adverse impact would depend on the design of the new facility and the degree to which it would be visible from traditionally valuable viewpoints within the Merced River corridor. The adverse visual effects of a transit center/day-visitor parking facility would be somewhat offset by beneficial effects, including a decrease of vehicle traffic in Yosemite Valley by increasing the movement of visitors via mass transit (i.e., shuttle buses). This could decrease the frequency of vehicle intrusions into views of the landscape. The net adverse effects of the development at Taft Toe or Camp 6 could be mitigated to a local, long-term, negligible to minor, adverse impact on scenic resources by implementation of mitigation measures described in Chapter II, under Mitigation Measures Common to All Action Alternatives.

The proposed 2C zoning in east Yosemite Valley and the 2B zoning in west Yosemite Valley are more restrictive in terms of permitted visitor uses and facilities than the absence of zoning in the No Action Alternative and would allow for greater protection and restoration of natural resources,

an important component of the scenic environment within the Valley. For example, the visual character of El Capitan Meadow is degraded by visitor use due to trampling, soil compaction, and fragmentation. The current visitor-intensive use of El Capitan Meadow would be inconsistent with the 2B zoning, which is characterized by relatively quiet natural areas where visitor encounters would be low to moderate. Application of the 2B zoning prescriptions and implementation of VERP could result in management actions that would redirect use away from sensitive areas such as El Capitan Meadow and initiate restoration of the meadow. These management actions would have a local, long-term, minor, beneficial impact on the scenic quality of the meadow.

The intensity of potential impacts to scenic resources caused by Alternative 5 would be directly related to the effectiveness of methods employed in the park to reduce human-caused erosion within the river corridor and to reduce crowding at popular viewpoints. The VERP framework would monitor visitor use and its effects on scenic resources and scenic Outstandingly Remarkable Values. Facilities such as boardwalks and fences could be used to route people away from sensitive natural resources, while still permitting access to important viewpoints. Signs could be used to promote an understanding among park visitors of how to avoid harm to natural communities and features, though any physical facilities constructed to manage the impact of people on scenic resources should be designed for minimal disturbance of and visual intrusion into the natural landscape.

Scenic Outstandingly Remarkable Values within Yosemite Valley include views from the Merced River and its banks of waterfalls and water features (Nevada, Vernal, Illilouette, Yosemite, Sentinel, Ribbon, and Bridalveil Falls, and Silver Strand), rock cliffs (Half Dome, North Dome/Washington Column, Glacier Point, Yosemite Point/Lost Arrow Spire, Sentinel Rock, Three Brothers, Cathedral Rocks, and El Capitan), and meadows (Stoneman, Ahwahnee, Cook's, Sentinel, Leidig, El Capitan, and Bridalveil). There is a scenic interface of river, rock, meadow, and forest throughout the segment. Alternative 5 would protect and enhance the scenic Outstandingly Remarkable Values through the application of 2B and 2C management zoning in the Valley and VERP. These management elements would place restrictions on new development and would encourage restoration activities. An example of a restoration activity that could be implemented includes thinning or removal of unnaturally dense stands of conifer trees along the riverbank and replacing them with stands of broad-leaved trees, as existed before Euro-American settlers began altering the natural plant communities within Yosemite Valley. This would likely open views of scenic Outstandingly Remarkable Values from the Merced River corridor. Application of the management zoning and implementation of VERP would have a local, long-term, negligible, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values.

Impacts in the Merced River Gorge and El Portal. The majority of the Merced River gorge would have a quarter-mile boundary, be zoned 2A+, 2A, and 2B, and would receive increased protection over the absence of zoning under the No Action Alternative. Extensive use of 2A+, 2A, and 2B zoning in the gorge would substantially limit areas where new development could occur. Management zoning would ensure that the natural appearance of the gorge would be maintained, which would have a local, long-term, negligible, beneficial impact on scenic resources.

Scenic Outstandingly Remarkable Values of the Merced River gorge include views from the Merced River and its banks of the Cascades, spectacular rapids among giant boulders, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock. The extensive application of 2A+, 2A, and 2B zoning and the quarter-mile boundary over a majority of the Merced River gorge would protect and enhance these Outstandingly Remarkable Values. Management zoning in the gorge would substantially limit areas where new development could occur and would maintain the natural appearance of the gorge, ensuring the protection of the scenic Outstandingly Remarkable Values.

Substantial portions of El Portal would be zoned 3C (e.g., Railroad Flat, Racheria Flat, Trailer Village, Hillside, Old El Portal), which could allow additional development (e.g., employee residences in Yosemite Valley could be relocated to the El Portal Administrative Site). Potential development could have local, long-term, minor, adverse effects on the scenic character of the Merced River corridor due to the potential introduction of new development in El Portal. Adverse effects could be mitigated by implementing mitigation measures described in Chapter II, under Mitigation Measures Common to All Action Alternatives.

Impacts in the South Fork. The upper and lower portions of the South Fork would be zoned 1A, 1B, and 2A+. The majority of the South Fork through Wawona would be zoned 2B, 2C, 3A, 3B, and 3C. The 1A, 1B, 2A+, and 2B management zoning would increase protection over the absence of zoning under the No Action Alternative. Application of these zones on the South Fork would substantially limit areas where new development could occur. The 1A, 1B, 2A+, and 2B management zones would ensure that the natural appearance of these areas of the South Fork would be maintained, which would have a local, long-term, minor, beneficial impact on scenic resources.

Substantial portions of the Wawona area would be zoned 3A, 3B, and 3C. These areas include existing developments, such as Wawona Campground (zone 3A), the Wawona Hotel (zone 3B), the wastewater treatment plant and maintenance facility (zone 3C), and residential and commercial areas in Section 35 (zones 3C and 3A/3C). An area on the south side of the river in Section 35 would be zoned 3A/3C-that currently has only limited development. Naturally vegetated and undeveloped areas in the 3A/3C zoned area of Section 35 could be developed with camping or housing uses. If such development were to occur, this would have a local, long-term, minor, adverse effect on scenic resources in Wawona, due to the visual intrusion of new development in areas that are currently undeveloped. This impact would be minor, because much of Section 35 is currently developed with similar uses.

Scenic Outstandingly Remarkable Values of the South Fork include views from the Merced River and its banks of large pothole pools within slick rock cascades, old growth forest, and meadows, Wawona Dome, and continual white-water cascades in the deep and narrow river canyon below Wawona. Alternative 5 would protect and enhance the scenic Outstandingly Remarkable Values through the application of 1A, 1B, 2A+, and 2B management zoning along the South Fork and VERP. These management elements would place restrictions on new development and would encourage restoration activities. Should VERP monitoring reveal degradation of riparian vegetation due to visitor use (e.g., informal trails), VERP management actions (e.g., educational signs, limits on visitor use, restoration) could be implemented to achieve the desired condition for

the resource and management zone. Such management elements would protect scenic Outstandingly Remarkable Values, including views from the river and its banks of unique features, and would have a local, long-term, negligible, beneficial effect on scenic resources.

Summary of Alternative 5 Impacts. Generally, application of management zoning and VERP would have a local, long-term, negligible, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley, designated Wilderness, the Merced River gorge, and Wawona, due to opportunities to restore degraded areas of the Merced River corridor, and to implement management actions to maintain desired resource conditions pursuant to VERP. This beneficial impact has been partially offset by management zoning that allows for certain new developments to occur, such as additional camping and lodging, and a transit center in Yosemite Valley, and camping or housing in Section 35 in Wawona. In designated Wilderness, the impacts would be negligible and beneficial, because scenic resources in Wilderness would experience somewhat perceptible improvements compared to Alternative 1. In El Portal, this alternative would have a local, long-term, minor, adverse effect on the scenic character of the Merced River corridor due to the potential introduction of new development in El Portal.

Cumulative Impacts

Cumulative impacts to scenic resources discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The projects identified below include only those projects that could affect scenic resources within the river corridor or in the immediate park vicinity.

Past Actions. Scenic resources have been affected by numerous past actions since the inception of the park. Primary among these, when considered in relation to the potential effects of the *Merced River Plan*, is the alteration of natural communities caused by Euro-American settlers who lived in the park. For example, attempts to establish agricultural activities and the development of tourism resulted in the drying out of the Valley by breaching the moraine and controlling naturally occurring fires, which affected vegetation patterns along the Merced River. Broad-leafed trees along the river banks were replaced by the comparatively dense stands of conifers that exist today. This has had a local, long-term, adverse effect on scenic resources, as the conifers now block views of important scenic resources that were viewable before the vegetation patterns were changed.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor, and calls for the formalization of camping and launch facilities for non-motorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net

beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Projects that could have a cumulative, beneficial effect on scenic resources include those that could reduce the number of vehicles entering the park, and therefore the frequency of intrusion of vehicles into the scenic landscape. Projects that improve the general health of ecosystems viewable from or within the Merced River corridor also would result in a net cumulative beneficial effect on scenic resources. Examples of these types of projects are:

- The Yosemite Area Regional Transportation System (YARTS)
- Shuttle Bus Stop Improvements (NPS).
- Yosemite Valley Update to the *Yosemite Fire Management Plan* (NPS)
- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- The Sierra Nevada Framework for Conservation and Collaboration, and the Management Direction for the John Muir, Ansel Adams, Dinkey Lakes, and Monarch Wildernesses (USFS)

The general goal of these projects is to either reduce private vehicle traffic in the park, and especially in Yosemite Valley (which would reduce the frequency of vehicles intruding into important scenic resources viewable within or from the Merced River corridor), or to improve the health of ecosystems that make up parts of important scenic resources, either in the park or on lands adjacent to the park. For example, the update to the *Yosemite Wilderness Management Plan* could result in the removal of the Merced Lake High Sierra Camp, reducing site-specific erosion and trampling and restoring natural vegetation. These cumulative projects would have a net long-term, beneficial impact on scenic resources.

Reasonably foreseeable projects that could have an adverse effect on scenic resources include:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Yosemite View parcel land exchange, El Portal (NPS)

The local, long-term, adverse effects of these reasonably foreseeable projects would be related to the potential introduction of new structures and/or infrastructure that would intrude into views of important scenic resources within or viewable from the Merced River corridor. For example, the Yosemite View parcel land exchange could result in new development in an area of El Portal that is currently undeveloped and reduce the vegetative screening of the existing motel complex. This project would result in increased views of developed structures on the banks of the Merced River from Highway 140.

Reasonably foreseeable projects that could have a mixed effect on scenic resources include:

- The *Yosemite Valley Plan* (NPS)
- Wawona Campground Improvement (NPS)

The *Yosemite Valley Plan* would have a local, long-term, beneficial impact on scenic resources in the Valley due to restoration of disturbed or developed land to natural conditions and, in particular, large-scale restoration of areas within the A-scenic category (areas considered to have the most significant scenic views within the Valley). The *Yosemite Valley Plan* also would include areas of new development in the Valley (largely consolidated in the east Valley), Wawona, and El Portal, resulting in adverse impacts due to visual intrusions in the scenic landscape. However, impacts in these areas contribute directly to the improvement of the scenery within the Valley by removing facilities and restoring impacted areas.

The Wawona Campground Improvement project would have a local, long-term, beneficial impact on scenic resources due to restoration activities to improve the existing degraded campground, including activities to revegetate the riverbanks. Some aspects of the campground improvement project could have adverse effects on scenic resources due to new development in undeveloped areas, such as the proposal to construct an additional campground in Section 35.

These past and reasonably foreseeable future actions could have a net local, long-term, major, beneficial cumulative effect on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems, and reducing the number of vehicles. Scenic resources in the Wilderness segments would experience local, long-term, negligible, beneficial cumulative impacts due to the reduction of site-specific erosion and trampling and restoration of natural vegetation. In some developed areas in Wawona and El Portal, the cumulative projects would result in local, long-term, minor, adverse cumulative impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, major, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial, because scenic resources in Wilderness areas would experience somewhat detectable improvements compared to Alternative 1. In some developed areas in Wawona and El Portal, Alternative 5 and the cumulative projects would result in local, long-term, minor, adverse impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley.

Conclusions

Generally, application of the management zoning and VERP would have a local, long-term, negligible, beneficial impact on scenic resources and scenic Outstandingly Remarkable Values in Yosemite Valley, designated Wilderness, the Merced River gorge, and Wawona due to opportunities to restore degraded areas of the Merced River corridor, and to implement management actions to maintain desired resource conditions pursuant to VERP. This beneficial impact would be partially offset by management zoning that allows for certain new developments to occur, such as additional camping and lodging, a transit center in Yosemite Valley, and

camping or housing in Section 35 in Wawona. In designated Wilderness, the impacts would be negligible and beneficial because scenic resources in the Wilderness area would experience somewhat perceptible improvements. In El Portal, this alternative would have a local, long-term, minor, adverse effect on the scenic character of the Merced River corridor due to the potential introduction of new development in El Portal.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in local, long-term, major, beneficial impacts on scenic resources in Yosemite Valley because of the overall emphasis on restoring disturbed or developed land to natural conditions, improving the health of ecosystems within or adjacent to the park, applying management zoning in the Merced River corridor, and implementing VERP. In designated Wilderness, the cumulative impacts would be minor and beneficial, because scenic resources in Wilderness would experience somewhat detectable improvements compared to Alternative 1. In some developed areas in Wawona and El Portal, Alternative 5 and the cumulative projects would result in local, long-term, minor, adverse impacts to scenic resources due to visual intrusions in the scenic landscape from new facilities, such as facilities being relocated from Yosemite Valley.

Socioeconomics

Social Environment

Analysis

General Impacts. Under the application of management zones for Alternative 5 in Yosemite Valley, the Yellow Pine Campground would be zoned 3B/3C. The volunteer camping use could be replaced with visitor camping use, displacing the volunteers. If volunteer camping is replaced by visitor camping, volunteer camping could be relocated elsewhere in the corridor or the Valley, resulting in no net loss of volunteer camping compared to the No Action Alternative. If volunteer camping were replaced by visitor camping, and this use were not relocated elsewhere, there would be a net loss of volunteer camping in the Valley, a unique facility in Yosemite Valley. The loss of volunteer camping would have a long-term, negligible, adverse impact on the local social environment of Yosemite Valley.

Under Alternative 5, the occupants of one National Park Service employee residence could be displaced in Section 35 in Wawona, because this residence would be inconsistent with the 2B zoning prescription applied to that area. In Section 35, volunteer camping could be developed in the area zoned 3A/3C. The effects on community amenities from the introduction of a new volunteer camping facility in Section 35 would be negligible, since the volunteer facilities would likely result in few new volunteers camping in Wawona compared to the overall residential population of Wawona.

The reduction in employee housing and volunteer camping in the Valley and Wawona would be somewhat offset by the potential ability to develop replacement employee housing in El Portal and Wawona (in areas with 3C zoning prescriptions). The social environment in El Portal and Wawona would experience a long-term, negligible, adverse impact associated with the limited impacts on community amenities from relocation of displaced employee housing to these

communities. The small numbers of facilities being affected would not have an appreciable effect on El Portal and Wawona.

Employee commuting distances and costs would increase if the displaced Wawona residence were relocated to El Portal or some other location. This employee could experience an approximately two-hour, round-trip daily commute from El Portal to Wawona.

The relocation of employee housing and associated effects on employee commutes would be a long-term, negligible, adverse impact on the local social environment of Wawona, because only one employee residence in this community would be affected, and the impact could be offset by the potential ability to develop housing in El Portal or in a compatible 3C zone in Wawona. Eligible residents who might be effected by actions of this plan, and who meet the compensation criteria under provisions of the Uniform Relocation Act, may be eligible for housing and moving benefits.

Summary of Alternative 5 Impacts. The possible reduction or relocation of employee housing (and associated effects on employee commutes) and volunteer camping would constitute a long-term, negligible, adverse impact on the local social environments of Yosemite Valley, El Portal, and Wawona. Volunteer camping could be removed from Yosemite Valley resulting in the loss of a unique housing option in the Valley. One government-owned employee residence could be relocated from Wawona and new volunteer camping could be introduced in Section 35, with negligible adverse impacts on employee commute and limited impacts to community amenities in Wawona. The displaced Wawona residence could be relocated to El Portal, which would have very limited impacts to community amenities in El Portal.

Cumulative Impacts. Cumulative effects on the social environment discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to this environmental discipline.

Past Actions. A substantial number of concession beds were damaged by the 1997 flood and were subsequently removed. The majority of the removed concession beds were replaced with temporary beds for concession employees, although not all of the beds were replaced, which resulted in a net loss of concessioner housing in Yosemite Valley. The loss of housing and the replacement of permanent housing with temporary housing has had a local, long-term, adverse effect on the social environment of Yosemite Valley.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have a net adverse effect; and (3) projects anticipated to have a mixed effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the social environment include:

- Yosemite Area Regional Transportation System (YARTS)
- Merced River Canyon Trail Acquisition (BLM)

Implementation of YARTS would provide additional transportation options for employees and community residents. YARTS could somewhat improve the commuting conditions of employees by providing regional transportation alternatives for those employees resulting in a regional, long-term, beneficial impact on employee commutes.

The Bureau of Land Management's Merced River Canyon Trail Acquisition would allow for the development of a recreational trail west of the El Portal Administrative Site. This project would somewhat improve community amenities in El Portal, resulting in a local, long-term, beneficial impact on the social environment of El Portal.

A reasonably foreseeable future project that could have an adverse effect on the social environment includes:

- The Yosemite View parcel land exchange, El Portal (NPS)

The Yosemite View parcel land exchange would somewhat reduce the amount of open space available to the community of El Portal, although the proposed motel development would incorporate a public trail system and limited nature/river interpretive areas. This project would result in a local, long-term, adverse impact to the social environment of El Portal. This would result from the strain on limited community amenities in El Portal, loss of open space, and the opportunity cost of removing the National Park Service Parkline land from consideration for other community needs.

A reasonably foreseeable future project that could have a mixed effect on the social environment includes:

- The *Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would remove substantial amounts of employee housing from Yosemite Valley, and would construct new employee housing in El Portal and Wawona, among other locations. Redesigned housing in Yosemite Valley and new housing in El Portal and Wawona would substantially improve the quality of housing in these communities. The social environment in Yosemite Valley would experience local, long-term, beneficial effects associated with reduced crowding, more secure housing conditions, and increased privacy. The social environment of the workforce would experience local, long-term, adverse effects associated with increases in commuting time, change of housing locale, and a decrease in social amenities near housing sites. For the Yosemite Valley workforce, the adverse effects may be so severe that they would no longer be willing to work in the Valley and may leave the area. The social environment in El Portal and Wawona would experience local, long-term, adverse effects due to substantial increases in housing in these communities, although it is expected that the projected population growth would be gradual. Even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal, there could be substantial strains on the limited community amenities of El Portal as employees transition from Yosemite Valley.

The cumulative projects would have a regional, long-term, negligible, beneficial impact on employee commuting conditions due to the provision of regional transportation alternatives. The cumulative projects would have a local, long-term, moderate to major, adverse effect on the

social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal). The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residence could be relocated under Alternative 5 by providing regional transportation alternatives for those employees. Alternative 5 and the cumulative projects would have a local, long-term, moderate to major, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal). The impact intensity would depend upon the extent that the cumulative projects' recommendations are implemented.

Conclusions. The possible reduction or relocation of employee housing (and associated effects on employee commutes) and volunteer camping would constitute a long-term, negligible, adverse impact on the local social environments of Yosemite Valley, El Portal, and Wawona. Volunteer camping could be removed from Yosemite Valley resulting in the loss of a unique housing option in the Valley. One government-owned employee residence could be relocated from Wawona and new volunteer camping could be introduced in Section 35, with negligible, adverse impacts on employee commute and limited impacts to community amenities in Wawona. The displaced Wawona residence could be relocated to El Portal, which would have very limited impacts to community amenities in El Portal.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible, beneficial impact by somewhat improving the commuting conditions of employees whose residence could be relocated under Alternative 5 by providing regional transportation alternatives for those employees. Alternative 5 and the cumulative projects would have a local, long-term, moderate to major, adverse effect on the social environments of Yosemite Valley, El Portal, and Wawona due to decreases in housing and social amenities near housing and increases in commuting time in Yosemite Valley, and substantial increases in housing in El Portal and Wawona (resulting in substantial strains on the limited community amenities of El Portal and Wawona, even though the *Yosemite Valley Plan* calls for the placement of community amenities in El Portal). The impact intensity would depend upon the extent that the cumulative projects' recommendations are implemented.

Visitor Populations

Analysis

General Impacts. Under the application of management zones for Alternative 5, many of the overnight accommodations located in the corridor could be maintained and could also be expanded to the levels provided in the Concession Services Plan. Accommodations at Yosemite Lodge could increase to levels provided in the *General Management Plan*, as amended, and Upper and Lower River Campgrounds could be reopened. Yellow Pine Campground would be zoned 3A/3C and could be converted from volunteer camping to a visitor campground accessible to the general public. In Wawona, visitor camping areas could potentially be developed in the 3A/3C zoned area in Section 35.

As described above, the number of overnight accommodations in the park (structured lodging and campsites) could be substantially increased from that under Alternative 1. An increase in these facilities would change the mix of park overnights and day visitors. It is assumed that the total number of annual visitors would be the same as under Alternative 1.

Should the total number of in-park accommodations increase, the total number of park overnights would likely increase, and the total number of day visitors would likely decrease. This is particularly true for local overnights who are more likely than day visitors to wish to lodge in the park. The shift in the Yosemite visitor population would constitute a local, long-term, moderate to major, beneficial impact on park overnight visitors, depending upon the extent of the potential increase in park overnight accommodations. The increase in park accommodations would be expected to be clearly detectable, since it could represent a substantial change as compared to total park accommodations.

Similar to Alternative 1, no changes in Yosemite visitor spending behavior would be expected. No major changes are proposed that would alter the types of goods and services available to visitors. Zoning prescriptions under this alternative would not exclude or attract different visitor groups or appreciably change the character of the “average” Yosemite visitor. Therefore, visitor spending patterns and estimates based on the 1998 YARTS survey are appropriate for use in estimating future visitor spending behavior. Based on the YARTS visitor survey, local overnights generally spend more than park overnights during their trip, who in turn generally spend more than day visitors (see table III-20 in Chapter III, Affected Environment). Compared to Alternative 1, it is expected that visitor spending would decrease somewhat in the affected region, because former local overnights would likely stay in the park as park overnights, spending less per capita on average than local overnights, based on the 1998 YARTS survey. Impacts to the regional economy associated with changes in visitor spending are discussed below under the heading “Regional Economy.”

Impacts on Low-Income Populations. Potential impacts on low-income populations that visit the park are related primarily to the availability and cost of overnight accommodations, and the range of available low-cost recreation activities. Low-income populations are currently underrepresented in the park compared to the state as a whole, and compared to the five counties surrounding the park. However, no information is available to precisely identify the visitation patterns of low-income visitors, such as where they stay and what activities they enjoy in the

park. Therefore, the potential impact of a change in lodging or recreation opportunities on low-income populations cannot be quantified.

In the absence of precise data, this analysis assumes that low-income visitors favor lower-cost accommodations, such as camping or lodging at Housekeeping Camp, and inexpensive activities such as swimming, wading, or hiking. Alternative 5 would not likely affect the availability of inexpensive activities. Therefore, the potential impact of Alternative 5 on low-income visitors is related primarily to the change in the availability of comparatively low-cost lodging accommodations. An increase in the number of campsites under Alternative 5 would benefit low-income visitors. The net effect on low-income visitors of such an increase in campsites would be a long-term, minor, beneficial impact.

Summary of Alternative 5 Impacts. Under Alternative 5, the number of overnight accommodations in the park could increase from that under Alternative 1. An increase in the total number of in-park accommodations would have a local, long-term, moderate to major, beneficial impact on park overnight visitors. The intensity of the beneficial impact would depend on the extent of the potential increase in overnight park accommodations.

Alternative 5 would likely result in a long-term, minor, beneficial impact on low-income visitors due to the potential increase in the number of available campsites.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of past and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the visitor populations.

Past Actions. Upper and Lower River Campgrounds were damaged by the 1997 flood and have been closed to visitors. In addition, a substantial number of units at the Yosemite Lodge were damaged during the flood, and have been removed. Closure of these campgrounds and lodging units reduced the number of in-park camping accommodations available in Yosemite National Park, further exacerbating unmet demand for accommodations in the park. Closure of these facilities has had a local, long-term, adverse effect on park overnighters, due to the clearly detectable reduction in park accommodations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into two general categories: (1) projects anticipated to have a net beneficial effect; and (2) projects anticipated to have a net adverse effect.

Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the visitor population include:

- Yosemite Area Regional Transportation System (YARTS)
- Wawona Campground Improvement (NPS)

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley if the Restricted Access Plan were implemented. It is anticipated that the

regional, long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

The Wawona Campground Improvement project would improve the existing camping facilities at Wawona Campground, and would construct additional campground facilities in Section 35 in Wawona. This project would have a local, long-term, beneficial impact on the visitor population by increasing the number of campsites in the park.

A reasonably foreseeable future project that could have a net adverse effect on the visitor population includes:

- *The Yosemite Valley Plan* (NPS)

The *Yosemite Valley Plan* would substantially reduce the number of lodging facilities and nominally reduce the number of campsites in Yosemite Valley, resulting in a local, long-term, adverse impact on the visitor population due to decreased opportunities to lodge and camp in the Valley. Since the number of less expensive lodging and camping units would be reduced under the *Yosemite Valley Plan*, the number of low income visitors able to stay overnight in the Valley may be reduced. This could represent a local, long-term, adverse impact on the low-income visitor population.

The cumulative projects would have a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Given the reduction in the number of lodging and camping units, these cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to decreased opportunities to lodge and camp in the Valley.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 5 and the cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to the potential overall reduction in the number of lodging and camping units in the park. The potential for overnight accommodation facilities to be increased in the Valley, as described in Alternative 5 of the *Merced River Plan/FEIS*, would be clarified by the specific actions proposed in the *Yosemite Valley Plan*.

Conclusions. Under Alternative 5, the number of overnight accommodations in the park could increase from that under Alternative 1. An increase in the total number of in-park accommodations would have a local, long-term, moderate to major, beneficial impact on park overnight visitors. The intensity of the beneficial impact would depend on the extent of the potential increase in park overnight accommodations.

Alternative 5 would likely result in a long-term, minor, beneficial impact on low-income visitors due to the potential increase in the number of available campsites.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a regional, long-term, negligible to minor, beneficial impact on the visitor population by providing increased access for day visitors to the park. The intensity of the regional impact would be dependent on the number of visitors that would use the voluntary regional transit system. Alternative 5 and the cumulative projects would have a local, long-term, moderate, adverse impact on the visitor population, including low-income visitors, due to the potential overall reduction in the number of lodging and camping units in the park. The potential for overnight accommodation facilities to be increased in the Valley, as described in Alternative 5 of the *Merced River Plan/FEIS*, would be clarified by the specific actions proposed in the *Yosemite Valley Plan*.

Regional Economy

Analysis

General Impacts. As stated in the discussion of Visitor Populations, the number of overnight accommodations in the park could increase from that under Alternative 1. Should the total number of in-park accommodations increase, visitor spending in the affected region would be expected to decrease somewhat, because former local overnighers would likely stay in the park rather than the gateway communities, and park overnighers generally spend less per capita than local overnighers. The decrease in visitor spending would have a long-term, negligible, adverse effect on the regional economy. The shift in local overnighers to park overnighers potentially resulting under Alternative 5 would not have a discernible effect on the regional socioeconomic environment, given the small magnitude of the potential shift in visitor spending as compared to the size of the regional tourist economy. The decrease in visitor spending in the affected region would negligibly decrease output, income, and employment in the gateway region.

Alternative 5 could result in an increase in regional employment. Application of the management zone prescriptions could result in the development of facilities (such as a transit center at Taft Toe or Camp 6), resulting in an increase in employment within the park. In addition, changes in the composition of park overnighers and local overnighers could shift employment associated with overnight accommodations from the gateway region to within the park. These shifts in employment would constitute a long-term, negligible, beneficial impact on the regional economy. The impact would be beneficial, since it would be unlikely that Alternative 5 would decrease regional employment compared to the No Action Alternative.

Alternative 5 could result in some construction activity associated with relocation or development of facilities in the river corridor. Although the magnitude of the construction activity is not quantifiable, the activity would generate construction-related output, employment, and income in the regional economy. This would have a short-term, negligible, beneficial impact on the regional economy, due to the temporary nature of construction activity and the expected small magnitude of the construction activity compared with the size of the construction industry in the affected region.

Summary of Alternative 5 Impacts. Under Alternative 5, the number of overnight accommodations in the park could increase from that under Alternative 1. Should the total number of in-park accommodations increase, Yosemite visitor spending would decrease in the affected region, resulting in a long-term, negligible, adverse effect on the regional economy. The impact would be negligible due to the relatively small magnitude of the potential shift in visitor spending when compared to the size of the regional tourist economy.

Alternative 5 could result in shifts in regional employment, which would have a long-term, negligible, beneficial impact on the regional economy.

Implementation of Alternative 5 could result in some construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to the regional economy.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future projects that could have a cumulative, beneficial effect on the regional economy are listed below.

- The *Yosemite Valley Plan* (NPS)
- Yosemite Area Regional Transportation System (YARTS)
- Development-related projects, such as Yosemite West Rezoning Application (NPS), Hazel Green Ranch (Mariposa Co.), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort, June Lake (Mono Co.), Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge Expansion (Tuolumne Co.), Hardin Flat Lodging and Conference Facilities (Tuolumne Co.), Motel and Restaurant, Second Garrotte Basin (Tuolumne Co.), Silvertip Resort Village Project (Mariposa Co.)

The *Yosemite Valley Plan* would have a short-term, beneficial impact on the regional economy resulting from project construction spending and employment associated with implementation of the alternative. In the long-term, although the *Yosemite Valley Plan* would result in a decrease in in-park accommodations (and its associated visitor spending), the overall economic impacts of changes from visitor spending and operations spending to the regional economy would be long-term and beneficial. It is anticipated that Yosemite visitor spending associated adverse impacts to the regional economy would be more than offset by increased regional output and employment from expanded National Park Service in-park operations and the proposed new park visitor transit system.

YARTS would provide increased access for day visitors to the park and a means for visitors to travel to the Valley when the Restricted Access Plan were implemented. It is anticipated that the long-term, beneficial effect of YARTS would be dependent on the number of visitors that would use the voluntary regional transit system.

Several new lodging facilities are planned in the affected region, including tent cabins and hard-sided cabins at Hazel Green Ranch outside the park near the Big Oak Flat Entrance Station

(Mariposa Co.), a hotel complex as part of the Yosemite West Rezoning Application (NPS), Yosemite Motels, El Portal (Mariposa Co.), Double Eagle Resort in June Lake, Tioga Inn, Lee Vining (Mono Co.), Evergreen Lodge expansion near Camp Mather, a hotel in Hardin Flat, a motel and restaurant in Second Garrotte Basin (Tuolumne Co.), and the Silver Tip Resort Village Project in Fish Camp. Development of these facilities would expand the overnight lodging capacity of the gateway region. By providing local construction spending and employment during development, increasing lodging revenues and transient occupancy taxes, and providing sources of income and employment for area residents, these facilities would have a long-term, beneficial effect on the regional economy. The development of these facilities would increase demand for government services, including police, fire, and other services; it would be expected, however, that local government taxes assessed for these facilities would offset the incremental costs associated with providing such services.

These cumulative projects would have a short-term, minor, beneficial effect on the regional economy due to project construction spending and employment associated with implementation of the projects. The cumulative projects would have a long-term, minor, beneficial effect on the regional economy due to increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increased lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the cumulative projects. Alternative 5 and the cumulative projects would result in a long-term, minor, beneficial impact on the regional economy due to increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Conclusions. Under Alternative 5, the number of overnight accommodations in the park could increase from that under Alternative 1. Should the total number of in-park accommodations increase, Yosemite visitor spending would decrease in the affected region, resulting in a long-term, negligible, adverse effect on the regional economy. The impact would be negligible due to the relatively small magnitude of the potential shift in visitor spending when compared to the size of the regional tourist economy.

Alternative 5 could result in shifts in regional employment, which would have a long-term, negligible, beneficial impact on the regional economy.

Implementation of Alternative 5 could result in some construction activity, which would have a short-term, negligible, beneficial impact on the regional economy.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a short-term, minor, beneficial impact on the regional economy due to project construction spending and employment associated with development of the cumulative projects.

Alternative 5 and the cumulative projects would result in a long-term, minor, beneficial impact on the regional economy due to increased regional output and employment from expanded National Park Service in-park operations, increased access for day visitors to the park, and increasing lodging revenues and transient occupancy taxes and providing sources of income and employment for area residents.

Concessioner

Analysis

General Impacts. Under the application of management zones for Alternative 5, lodging accommodations at Yosemite Lodge could increase to levels provided in the *General Management Plan*, as amended. The extent to which accommodations at Yosemite Lodge could increase is not known; however, the increase could be substantial, which could have a beneficial impact on primary park concessioner revenues.

Under the current concession contract, a greater than 2% change in concession revenues would constitute a major impact for the primary park concessioner because of the high fixed costs experienced by the concessioner. This threshold provides a reasonable opportunity for net profit for the concessioner in relation to capital invested and the obligations of the contract, as required by the National Park Service Concessions Management Improvement Act of 1998. An increase in Yosemite Lodge accommodations could result in an approximately 10% increase in the annual revenues of the park concessioner, which would constitute a short-term, major, beneficial impact on concession operations. The impact would be short-term because it would extend through the period of the current concession contract, which expires in 2008, after which a new contract would be negotiated. In the long-term, the impacts to the park concessioner would be unknown because the terms of the future contract are unknown.

Summary of Alternative 5 Impacts. Under Alternative 5, increasing accommodations at Yosemite Lodge to levels provided in the *General Management Plan*, as amended, would constitute a short-term, major, beneficial impact to park concession operations.

Cumulative Impacts. Cumulative socioeconomic impacts discussed herein are based on analysis of reasonably foreseeable future actions in the Yosemite region in combination with potential effects of this alternative. The cumulative projects that follow are those most relevant to concessioner operations.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region that could have an adverse effect on the concessioner are listed below.

- The *Yosemite Valley Plan* (NPS)
- Update to the *Yosemite Wilderness Management Plan* (NPS)

The *Yosemite Valley Plan* proposes changes to park facilities that are expected to have a local, long-term, adverse impact on the primary concessioner. The adverse impact is associated with locating new employee housing outside of the Valley, and a decrease in annual concessioner

profits (although the profit loss could be and result in the concessioner's net profit being unaffected).

The update to the *Yosemite Wilderness Management Plan* (NPS) could restrict visitor use of the Merced Lake High Sierra Camp, resulting in closure of the camp to overnight lodging and a loss of revenues to the concessioner associated with providing overnight lodging services. The cumulative effect of the potential closure of Merced Lake High Sierra Camp would be a local, long-term, adverse impact on primary park concessioner revenues.

The cumulative projects would have a local, long-term, minor, adverse impact on the primary park concessioner associated with locating new employee housing outside of the Valley, a decrease annual concessioner profits (although this could be offset and result in the concessioner's net profit being unaffected), and possible closure of Merced Lake High Sierra Camp. The impact intensity of any planning projects would depend upon the extent that the plan's recommendations are implemented.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on the concessioner associated with locating new employee housing outside of the Valley, a decrease annual concessioner profits (although this could be offset and result in the concessioner's net profit being unaffected), and possible closure of Merced Lake High Sierra Camp. The short-term, major, beneficial impacts associated with the possible expansion of Yosemite Lodge in Alternative 5 of the *Merced River Plan/FEIS* would be incorporated by the proposed Yosemite Lodge expansion in the *Yosemite Valley Plan*.

Conclusions. Under Alternative 5, increasing accommodations at Yosemite Lodge to levels provided in the *General Management Plan*, as amended, would constitute a short-term, major, beneficial impact to primary park concession operations.

Alternative 5 and the cumulative projects within and in the vicinity of Yosemite National Park would result in a long-term, minor, adverse impact on the primary park concessioner associated with locating new employee housing outside of the Valley, a decrease annual concessioner profits (although this could be offset and result in the concessioner's net profit being unaffected), and possible closure of Merced Lake High Sierra Camp. The short-term, major, beneficial impacts associated with the possible expansion of Yosemite Lodge in Alternative 5 of the *Merced River Plan/FEIS* would be incorporated by the proposed Yosemite Lodge expansion in the *Yosemite Valley Plan*.

Park Operations and Facilities

Analysis

The following discussion provides an overview of the types of impacts to park operations and facilities that could occur within each segment of the Merced River corridor from implementation of Alternative 5.

Impacts in Wilderness. The wilderness reaches of the Merced River would be zoned consistent with existing conditions and use (1A, 1B, and 1C, except at existing facilities, where the zoning

would be 1D); management practices and use levels would continue to be based on the Wilderness Act and federal and Yosemite National Park wilderness policies and guidelines. The proposed zoning is not anticipated to alter visitor use patterns or facilities within wilderness reaches of the Merced River (main stem and South Fork) compared to the No Action Alternative. Consequently, the application of zoning within wilderness segments would have no effect on park operations or facilities. Development (short-term impacts) and implementation (long-term impacts) of the VERP framework for wilderness segments of the main stem and South Fork of the Merced River would require additional staff commitments, resulting in minor to moderate, adverse impacts on park operations (primarily resources management, interpretation, and protection staff).

Impacts in Yosemite Valley. The proposed zoning of Yosemite Valley in combination with the VERP framework could alter facilities, management of visitors, and restoration activities within the Merced River corridor and could increase demand on park staff and facilities. The proposed base zone (2C) for east Yosemite Valley would be primarily intermixed with Developed Zones (3A, 3B, and 3C) and Diverse Visitor Experience Zones (2A, 2B, and 2D). Additional facilities could include roads (new or relocated), improved trails, shuttle bus stops, restrooms, picnic tables, non-motorized watercraft launch and removal facilities, and other facilities to support active individual and group recreation uses and access to the river. Construction of new facilities (e.g., campsites at Upper Pines Campground or Upper River Campground) would increase demands on staff in the short term during planning and construction. Over the long term, new facilities could increase the demand on park operations. For example, construction of additional campgrounds or lodging facilities would likely increase maintenance requirements (adverse impact).

Application of proposed management zoning under this alternative could increase or have no net effect on overnight accommodations in Yosemite Valley (campsites or structured lodging) compared to the No Action Alternative. Although the proposed zoning would allow for additional lodging and camping facilities to be constructed, these actions are not prescribed by the plan and are considered speculative. If the total number of campsites and lodging facilities within Yosemite Valley were increased, additional visitors could be accommodated within the Merced River corridor, which would shift the mix of park overnight visitors and day visitors (i.e., more visitors would be able to stay overnight in the park). If the number of park overnighers increased, then less regional traffic (entering and leaving the park) would be generated, because the additional overnighers would not need to make two trips per day between their out-of-park accommodations and attractions within the park. This would have a long-term, minor, beneficial impact on park operations and facilities by reducing overall road wear and maintenance requirements. However, this beneficial effect would be negated because, as the number of visitors and duration of visitor impact within the corridor increased, demand for maintenance as well as for visitor protection, resource protection, and restoration services would also increase.

Parking spaces inconsistent with the 2B zone could be removed from the Merced River corridor. If those spaces were removed and not relocated elsewhere (and assuming no decrease in visitation), then demand for road maintenance, protection, and resources (restoration) staff could increase, as visitors unable to find an authorized place to park could circle the Valley (increasing road wear) or could decide to park in unauthorized/improper areas. This would have a long-term,

minor, adverse impact on park operations in Yosemite Valley. If parking spaces were relocated to other areas in the river corridor with a 3C zone designation (e.g., a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6 in Yosemite Valley), the relocated spaces would reduce the above-described adverse effects of removing parking spaces within the river corridor. However, additional demand for facilitates maintenance would be created, resulting in a negligible to minor, adverse effect on park operations.

Potential future development of a transit center and/or day-visitor parking facility in Yosemite Valley would allow the National Park Service to more effectively manage access to the Merced River corridor. Day visitors (i.e., visitors without reservations for overnight accommodations in Yosemite Valley) would be intercepted at a traffic check station on Southside Drive near the El Capitan crossover and would be directed to the transit center and/or day-visitor parking facility (at either Taft Toe or Camp 6). Day visitors then would move between destinations in the Valley by shuttle bus, bicycle, or on foot. Shifting visitors (local overnighers and day visitors) from their private vehicles to Valley shuttle buses would redirect demand from currently affected park operations (e.g., protection) to other divisions (e.g., restoration, maintenance, and custodial services). While the number of private vehicles would be reduced, the number of shuttle buses would increase. The increased weight of shuttle buses would likely increase wear on Valley roads and require increased maintenance (a long-term, moderate, adverse impact). In addition, the zoning of lands adjacent to the potential transit center and/or day-visitor parking facility (zone 2B) would call for minimizing the adverse impacts of human presence in those parts of the river corridor. The challenge of managing the highly concentrated flow of visitors into and out of the transit center and/or day-visitor parking facility, while affording maximum protection to adjacent lands, would also be likely to increase demand on park operations services and facilities, such as restoration, protection, maintenance, and custodial services. Because of these countering factors, it is unclear whether construction of a transit center and/or day-visitor parking facility would have an overall adverse or beneficial impact on park operations and facilities.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have short- and long-term, major, adverse impacts on park operations and facilities because visitor use is relatively high (is expected to remain consistent or increase), access throughout the Valley is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. For example, if El Capitan Meadow (zone 2B) were managed to the desired condition (e.g., moderate to high-quality meadow habitat with low to moderate visitor encounters), demand on park operations (primarily protection and resources staff) would dramatically increase related to meadow restoration, patrolling (to discourage informal use of the meadow and informal parking), and direction of visitors to more appropriate zones (e.g., the proposed 2C picnic area at the base of El Capitan). This effect would be most pronounced during initial application of VERP management actions, while park visitors became accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a major, long-term, adverse impact on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Impacts in the Merced River Gorge and El Portal. The gorge would be zoned (2A+, 2B, 2C, and 2D) consistent with existing conditions. Management of the 2D zone below the Cascades to its

desired condition is expected to increase maintenance, protection, and interpretation services within the zone (e.g., related to litter, restrooms, parking, education) and to implement the zone boundary (e.g., between the 2D Attraction Zone and the 2B Discovery Zone), resulting in a minor, long-term, adverse effect on park operations and facilities. The remainder of the gorge is relatively inaccessible, and visitor use is unlikely to increase. Consequently, there would be no impact on park operations and facilities for the remainder of the gorge compared to the No Action Alternative.

Potential future actions (e.g., removal of Cascades Diversion Dam), or new or rehabilitated facilities (e.g., restrooms, roads) could occur consistent with the proposed management zoning. If implemented, these future actions could create short-term, moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction/demolition. Because these potential actions would be implemented to protect resources (e.g., road repair could reduce erosion and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor to moderate and beneficial.

Application of the proposed Day Use (zone 2C) and Park Operations and Administration (zone 3C) zones in El Portal could increase or have no net effect on development within El Portal compared to the No Action Alternative. Because the management zoning does not specify specific actions, there would be no effect on development within El Portal and no impact on park operations and facilities compared to Alternative 1. Alternatively, if the 3C zones were fully built out, the demand on park operations and facilities would dramatically increase for El Portal compared to the No Action Alternative. In the short term, resource, planning, and facility staff would be required to accommodate construction of new facilities (short-term, moderate to major, adverse impact). Over the long term, demand on protection and maintenance staff would increase proportional to development, resulting in a long-term, moderate to major, adverse impact on park operations and facilities.

Development of the VERP framework and its implementation within the gorge and El Portal is considered to have only minor to moderate, adverse impacts on park operations and facilities because visitor use is relatively low and is expected to remain relatively low due to access and topography constraints.

Impacts in Wawona. The majority of Wawona would be zoned consistent with existing conditions and would have no net effect on park operations or facilities compared to Alternative 1. Potential future actions (e.g., construction of new restrooms) could occur consistent with the proposed management zoning. If implemented, these future actions could create short-term, moderate, adverse impacts on park operations, facilities, resources, and planning staff related to construction. Because these potential actions would be implemented to protect resources (e.g., bridge replacement to restore the free flow of the river and decrease erosion, scour, and the need for corrective maintenance), the long-term effect on park operations, facilities, maintenance, and resource staff would be minor and beneficial.

The implementation of the VERP framework within Wawona is considered to have only minor to moderate, adverse impacts (both short-term and long-term) on park operations and facilities, because visitor use is relatively low (and change in visitor use patterns for Wawona under this

alternative is considered speculative) and because the proposed management zoning is designed to facilitate implementation of the VERP framework over the long term (e.g., wilderness portions of the corridor immediately adjacent to developed zones are generally zoned 1B to account for the potential conflict with adjacent visitor and land uses).

Summary of Alternative 5 Impacts. In total, application of management zoning in combination with implementation of the VERP framework would substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by an increased need for research, planning, and monitoring to establish scientifically based indicators, standards, and monitoring protocols for the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones to their desired conditions would further increase demand on park staff and resources. Overall, implementation of VERP, in combination with other management elements proposed under Alternative 5, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Impacts would be most pronounced in Yosemite Valley and El Portal, where visitor use is more concentrated, but would affect the entire corridor to some degree.

Cumulative Impacts

Cumulative effects on park operations and facilities discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the immediate Yosemite region in combination with potential effects of this alternative. The extent to which past, present, or reasonably foreseeable projects could have a cumulative effect, when combined with other actions that could result under present National Park Service management strategies, is determined largely by whether such projects would affect demand for park operations services and facilities. For example, effects of projects that change the number of vehicles traveling through the park could combine with effects of the *Merced River Plan* to either increase or decrease the need for maintenance activities on roads and bridges. Similarly, projects that affect demand for other park operations services and facilities could also have a cumulative effect. These services include maintenance of utility systems, provision of interpretation programs, visitor protection, and resource management.

Past Actions. Park operations and facilities have been affected by numerous past National Park Service management decisions made since the inception of the park. Primary among those, when considered in relation to the potential effects of the *Merced River Plan*, include relocating the National Park Service maintenance shops and warehouse to El Portal (mostly adverse), removal of the hydroelectric generating plant (mostly adverse), professionalization of law enforcement staff (mostly adverse), rehabilitation of the water and electric distribution systems (mostly beneficial), improved communication systems (cell phones and radios, mostly beneficial), relocating the National Park Service wastewater treatment facility from Yosemite Valley to El Portal (mostly beneficial), and implementation of the prescribed fire program (adverse and beneficial). Overall, there is no net adverse or beneficial effect of these past actions on park operations and facilities.

Present Actions. Present actions that affect park operations and facilities include planning related to the *Yosemite Valley Plan* (NPS) and the El Portal Road Reconstruction Project (NPS). The *Yosemite Valley Plan* has substantially increased demand on resource, facility, and planning staff. The El Portal Road Reconstruction Project (NPS) is currently underway and affects park operations and facilities because the reconstruction is placing some increased demand on park operations staff.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions proposed in the region are separated below into three general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; and (3) projects anticipated to have a net adverse effect.

Projects that could have a cumulative, beneficial effect on park operations and facilities include those that could reduce the number of visitors entering the park, reduce the number or amount of facilities within the park, or reduce long-term maintenance activities. Examples of these types of projects include:

- Transportation projects including the Yosemite Valley Shuttle Bus Stop Improvements (NPS); South Fork Merced River Bridges Replacement (NPS); and Evergreen Road Improvements (multi-agency, see Appendix G)
- Several Yosemite utility projects such as, Replacement/Rehabilitation of Yosemite Valley Sewer Line, Tuolumne Meadows Water and Wastewater Improvements, White Wolf Water System Improvements, and Hodgdon Meadows Water and Wastewater Treatment Improvements (NPS), and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco)
- National Park Service planning efforts, including the South Entrance/Mariposa Grove Site Planning (NPS); update to the *Yosemite Fire Management Plan* (NPS), update to the *Yosemite Wilderness Management Plan* (NPS), and *Fire Management Action Plan for Wilderness* (USFS, Stanislaus)
- Rogge-Ackerson Fire Reforestation (Tuolumne Co.)

Although each of the aforementioned projects could have short-term, adverse effects associated with planning, construction, replacement, or rehabilitation, the general goal of each of these projects is to reduce long-term maintenance. Therefore, these projects could have a long-term, beneficial, cumulative impact on park operations and facilities.

Reasonably foreseeable projects that could have mixed adverse and beneficial effects on park operations and facilities include:

- The Yosemite Area Regional Transportation System (YARTS), which has a goal of increasing transportation options and reducing reliance on automobiles in the area
- Planned rehabilitation of Tamarack Campground, Yosemite Creek Campground, Hodgdon Meadow Campground, Wawona Campground Improvement, and Bridalveil Horse Camp (NPS)
- Development-related projects such as Yosemite West Rezoning Application, Crane Flat Campus Redevelopment (NPS. YNI); Tuolumne Meadows Development Concept Plan

(NPS); Resource Management Building (NPS); Expansion of Mariposa County Transit System (Mariposa Co.); and University of California, Merced Campus (Merced Co.)

Cumulative effects of the campground rehabilitation projects could be mixed, combining both adverse and beneficial effects. For example, the rehabilitation of Tamarack Campground would have a short-term, adverse effect on park operations and facilities during planning and construction. Post-construction, maintenance would be reduced compared to existing conditions, resulting in a long-term, beneficial impact on park operations and facilities.

Reasonably foreseeable projects that could have an adverse effect on park operations and facilities include:

- The *Yosemite Valley Plan* (NPS), which would implement the goals of the 1980 *General Management Plan*
- Tuolumne Meadows Development Concept Plan, and Tuolumne Wild and Scenic River Management Plan (NPS)
- Yosemite Area Regional Transportation System (YARTS)
- Several regional lodging projects, including Yosemite Motels, El Portal (Mariposa Co.); Silvertip Resort Village Project (Mariposa Co.); Tioga Inn, Lee Vining (Mono Co.); Hazel Green Ranch (Mariposa Co.), and Evergreen Lodge Expansion (multi-agency, see Appendix G)
- Merced River Canyon Trail Acquisition (BLM)
- Sierra Nevada Framework for Conservation and Collaboration (USFS)

Each of these projects would increase demand for services and facilities and add to the cumulative, adverse impact on park operations and facilities. For example, the *Yosemite Valley Plan* could substantially increase demand on park operations and facilities in the short term during planning, repair, rehabilitation, construction/demolition, and replacement of facilities (e.g., removal of the road through Stoneman Meadow, construction of new campsites, restoration of large areas of Yosemite Valley to natural conditions).

These past, present, and reasonably foreseeable future actions could have adverse, cumulative effects on park operations and facilities because of the increased demand on park operations services and facilities over both the short and long term. The combined effects of Alternative 5 with other cumulative projects would result in a long-term, major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Conclusions

Application of management zoning, in combination with development and implementation of the VERP framework, could substantially increase demand on park staff and resources. Resource and planning staff would be adversely affected in the short term by an increased need for research, planning, and monitoring to establish scientifically based indicators, standards, and monitoring protocols for the VERP framework. Over the long term, regular VERP monitoring and the implementation of VERP management actions to maintain management zones to their desired conditions would further increase demand on park staff and resources. Overall, implementation of

VERP, in combination with other management elements proposed under Alternative 5, is anticipated to have moderate to major, short- and long-term, adverse impacts on park operations and facilities. Impacts would be most pronounced in Yosemite Valley and El Portal, where visitor use is more concentrated, but would affect the entire corridor to some degree.

The combined effects of Alternative 5 with other cumulative projects would result in a long-term, major, adverse impact on park operations and facilities because of the increased demand on park operations services and facilities resulting from these projects.

Unavoidable Adverse Impacts

Under Alternative 5, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of seven management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, and the Visitor Experience and Resource Protection (VERP) framework.

Development of the VERP framework and its implementation within Yosemite Valley is considered to have an unavoidable adverse effect on park operations and facilities, because visitor use is relatively high (is expected to remain consistent or increase), access throughout the Valley is good, and the proposed zoning would set up VERP management conflicts relative to existing and proposed uses. This effect would be most pronounced during initial application of VERP management actions, while park visitors became accustomed to the new setting. Overall, the increased visitor management within Yosemite Valley would have a unavoidable adverse effect on park operations and facilities because of the need for increased interpretive and resource protection activities to achieve desired conditions within management zones.

Irreversible and Irretrievable Commitments of Resources

This section identifies any resources that would be lost either temporarily or permanently as a result of Alternative 5. This alternative provides a framework for decision-making on future management actions within the Merced River corridor. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of six management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, and the Visitor Experience and Resource Protection (VERP) framework.

If relocation of existing facilities and/or the development of new facilities within the river corridor occurred as a result of the management zone designations under Alternative 5, then this would result in the expenditure of energy to relocate or develop the facility. In addition, if the relocation of facilities and/or the construction of new facilities occurred, then there would be an irreversible commitment of materials, such as concrete, asphalt, wood, and metal that would be used in relocation or construction activities.

Relationship of Short-Term Uses of Man's Environment and Long-Term Productivity

This section compares the short- and long-term environmental effects of Alternative 5.

Under Alternative 5, a framework for decision-making on future management actions within the Merced River corridor would be provided. This would be accomplished through the application of a consistent set of decision-making criteria and considerations composed of six management elements: boundaries, classifications, updated Outstandingly Remarkable Values, the Section 7 determination process, management zoning, and the Visitor Experience and Resource Protection (VERP) framework. The 3C management zone under Alternative 5 could allow for the development of a transit center and/or day-visitor parking facility at either Taft Toe or Camp 6. If the construction of this transit center and/or day-visitor parking facility occurred, then this would have localized, short-term, adverse impacts on air quality, noise, cultural resources, and natural resources. In addition, if the transit center and/or day-visitor parking facility were constructed, then a long-term benefit to the park would occur through the reduction of traffic congestion, the improvement of local air quality in the Valley, and the provision of a more structured visitor experience in accessing the river corridor.